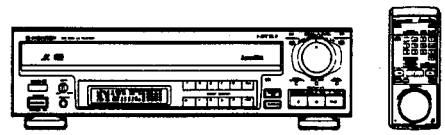
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
ARP2225

CD CDV LD PLAYER

CLD-1090

● **This manual is applicable to the KUC type.**

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This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

1. SAFETY INFORMATION

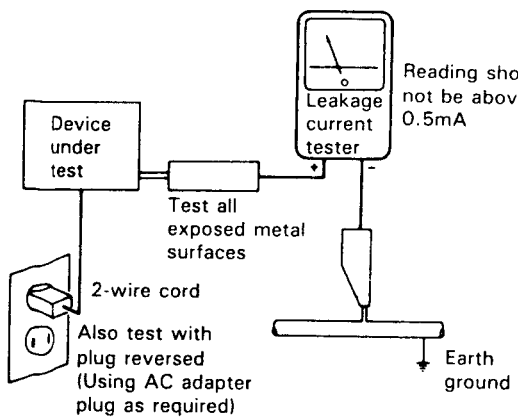
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

2. EXPLODED VIEWS AND PARTS LIST

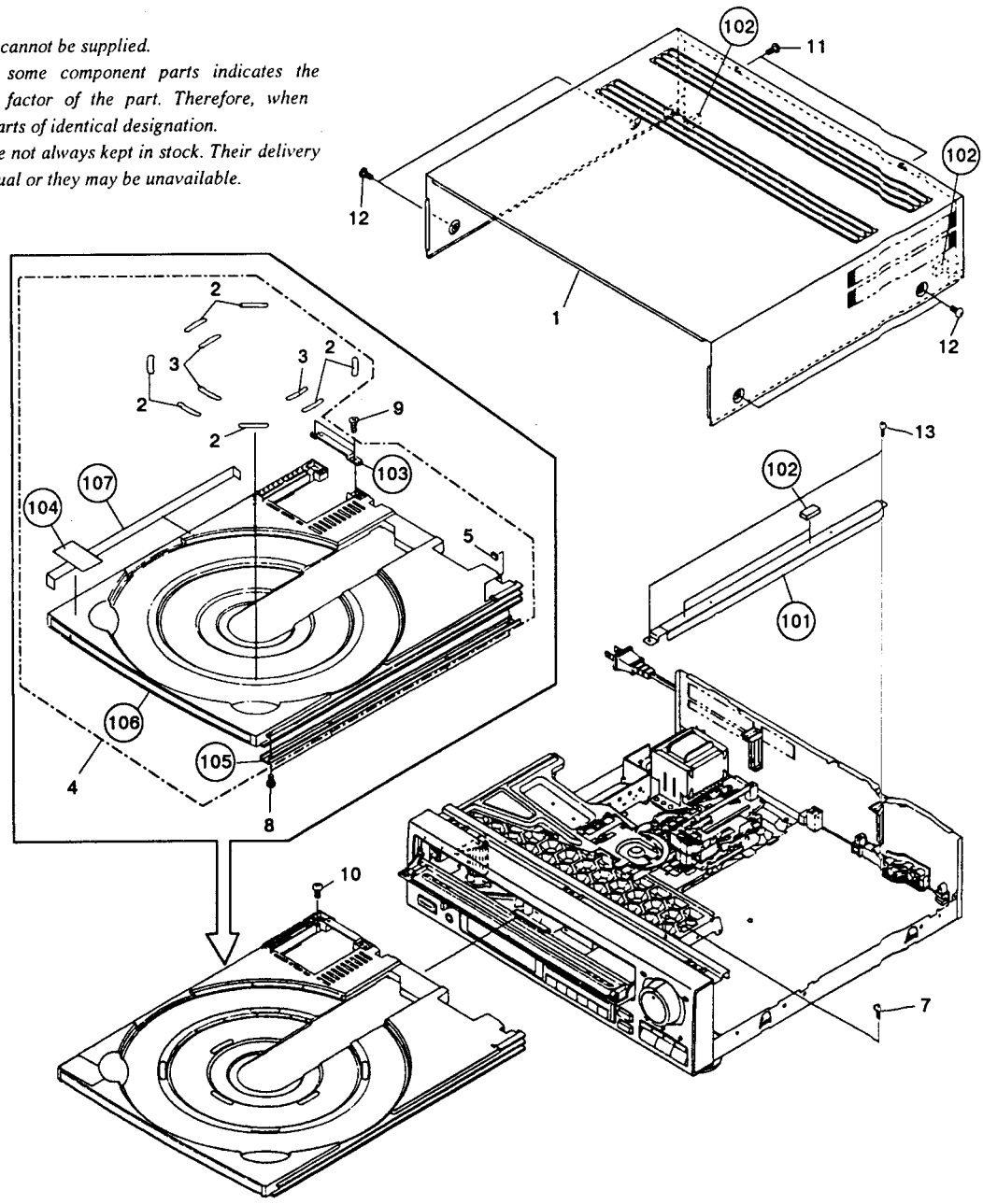
2.1 EXTERIOR SECTION

Parts List

Mark	No.	Description	Part No.
	1	Bonnet S	VXX1267
	2	Disc pad(L)	VEC1191
	3	Disc pad(S)	VEC1192
	4	Tray assembly	VXX1453
	5	Tray rubber	VEB1089
	6	• • • • •	
	7	Screw	PCZ30P080FMC
	8	Screw	BPZ30P080FCU
	9	Screw	CPZ30P100FMC
	10	Screw	BPZ30P140FMC
	11	Screw	BBZ30P080FCC
	12	Screw	BCZ40P060FZK
	13	Screw	BBZ30P060FCC
	101	Center angle	
	102	Cushion	
	103	Tray angle	
	104	Carry label	
	105	Tray reinforced plate	
	106	Tray	
	107	Side plate	

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

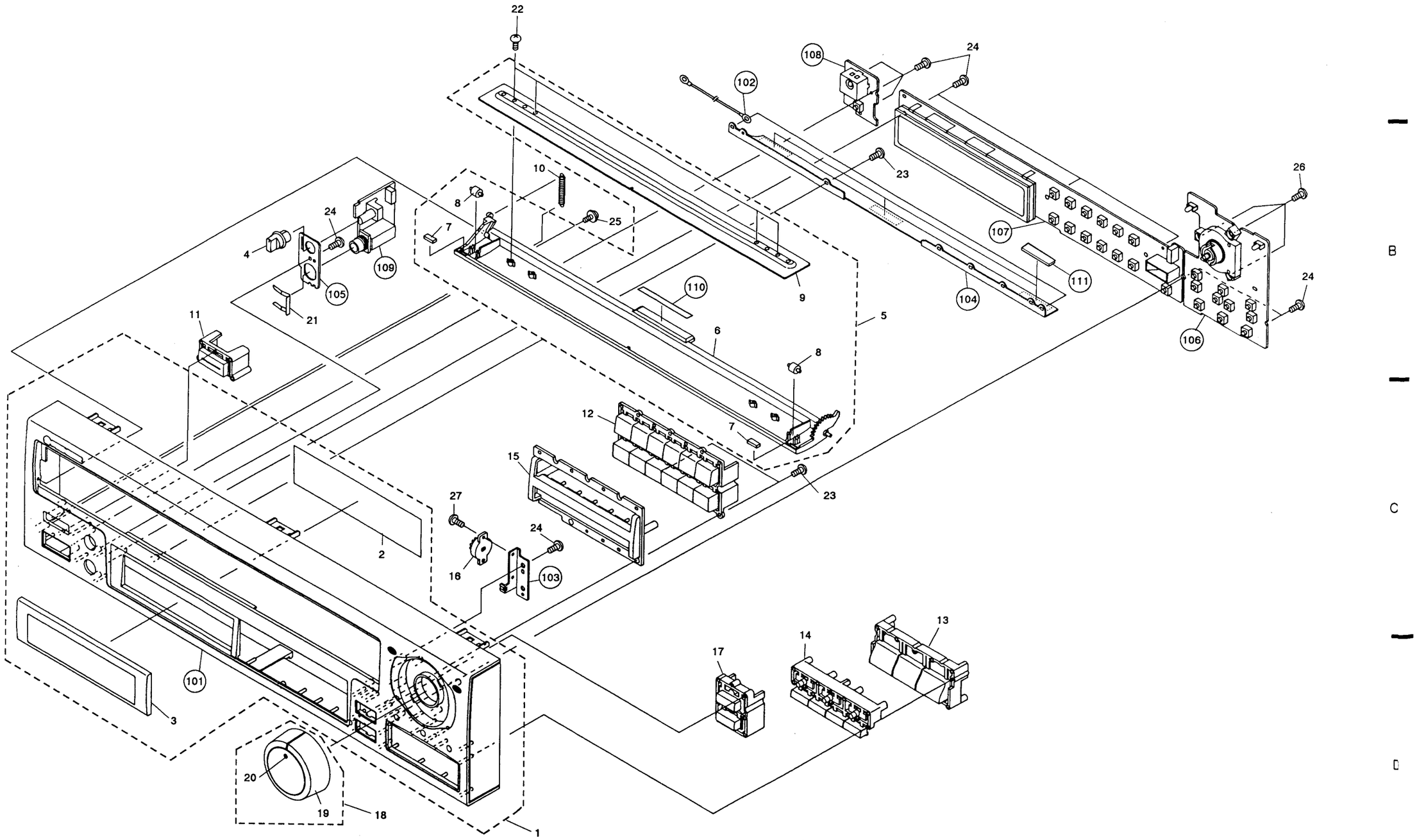


2.2 FRONT PANEL SECTION

Parts List

Mark	No.	Description	Part No.
	1	Front panel assembly S	VXX1549
	2	FL filter	VNK1659
	3	FL lens	VNK1660
	4	Volume knob	VNK1658
	5	Door assembly - S	VXX1548
	6	Front door assembly	VXA1572
	7	Door dump rubber	VEB1033
	8	Roller	VNL1042
	9	Door plate	VNE1482
	10	Door spring	VBH1136
	11	PW button	VNK1649
	12	Ten key	VNK1653
	13	Main key	VNK1654
	14	Sub key	VNK1655
	15	Sub panel	VNK1661
	16	Dumper assembly	VXA1053
	17	L key assembly	VXA1573
	18	Scan dial assembly	VXA1574
	19	Scan dial	VNK1656
	20	LED lens (S)	VNK1657
	21	Snap plate	VNE1102
	22	Screw	BPZ20P040FZK
	23	Screw	BBZ20P050FMC
	24	Screw	BPZ26P060FCU
	25	Screw	IPZ26P060FMC
	26	Screw	BPZ26P080FMC
	27	Screw	PMZ20P040FCU
	101	Front panel assembly	
	102	Earth lug assembly	
	103	Dumper plate	
	104	Reinforced plate	
	105	Jack holder	
	106	SHKY assembly	
	107	FLKY assembly	
	108	PSWB assembly	
	109	HEPB assembly	
	110	Spacer	
	111	Dump rubber	

Note: 106 SHKY, 107 FLKY, 108 PSWB and 109 HEPB assemblies are supplied for service as the FLKB assembly (VWM1160).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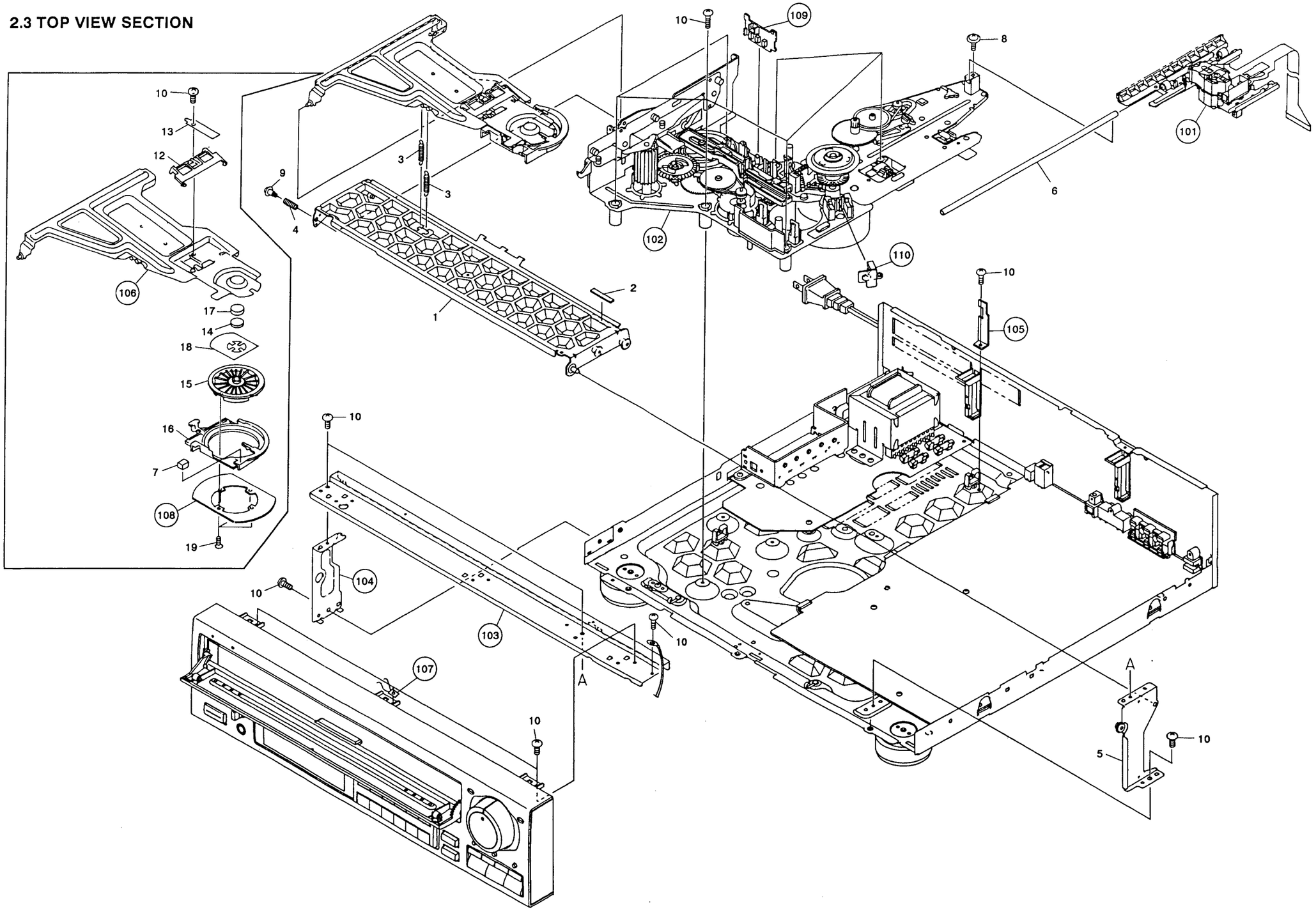
2.3 TOP VIEW SECTION



Parts List

Mark No.	Description	Part No.
1	Clamper arm (A) assembly	VXA1319
2	Rubber (A)	VEB1084
3	Clamper spring	VBH1094
4	Arm spring	VBH1093
5	Side stay (R) assembly	VXA1529
6	Carriage shaft	VLL1177
7	Clamper pad	VEC1264
8	Screw (B)	VBA1018
9	Screw (B)	VBA1008
10	Screw	BBZ30P060FCC
11	• • • • •	
12	Parallel link	VNL1254
13	Plate spring	VBK1014
14	Ball holder	VNL1289
15	Clamper S	VNL1248
16	Clamper holder	VNL1205
17	Rubber sheet	VEB1114
18	Thrust holder	VBK1018
19	Screw	CPZ20P050FMC

Mark No.	Description	Part No.
101	Rack assembly	
102	Mechanism assembly	
103	Front angle	
104	Side stay (L)	
105	SM head holder	
106	Clamper arm (B)	
107	Earth plate	
108	Stabilizer	
109	SW assembly	
110	FG assembly	

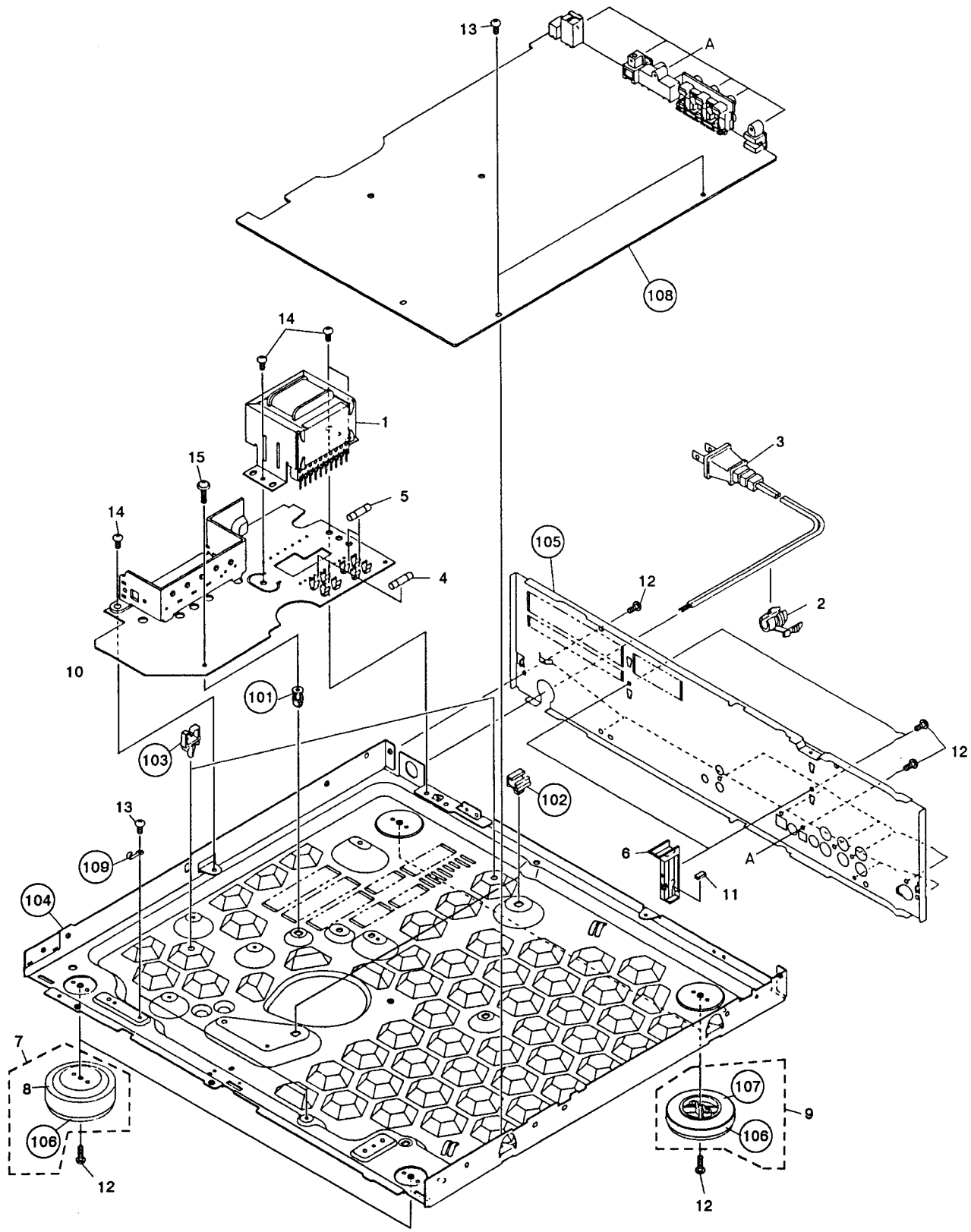
Note: 109 SW assembly and 110 FG assembly are supplied for service as the Mother assembly (VWM1159).

2.4 BASE SECTION

Parts List

Mark	No.	Description	Part No.
⚠	1	Power transformer	VTT1079
⚠	2	Strain relief	CM-22C
⚠	3	AC power cord	PDG1015
⚠	4	Fuse (FU203,FU204)(1A)	REK-080
⚠	5	Fuse(FU201,FU202) (3A)	VEK-018
	6	Tray stopper	VNL1202
	7	Insulator assembly	VXA1289
	8	Insulator	VNK1095
	9	Insulator assembly	VXA1290
◉	10	SYPS assembly	VWR1090
	11	Door dump rubber	VEB1033
	12	Screw	BBZ30P080FCC
	13	Screw	BBZ30P060FCC
	14	Screw	BCZ40P080FZK
	15	Screw	IPZ30P160FMC
	101	P. C. B spacer	
	102	P plate holder	
	103	Wire crip (B)	
	104	Base chassis	
	105	Rear panel	
	106	Stopper	
	107	Insulator	
	108	MAIN assembly	
	109	Cord holder	

Note: 108 MAIN assembly is supplied for service as the Mother assembly (VWM1159).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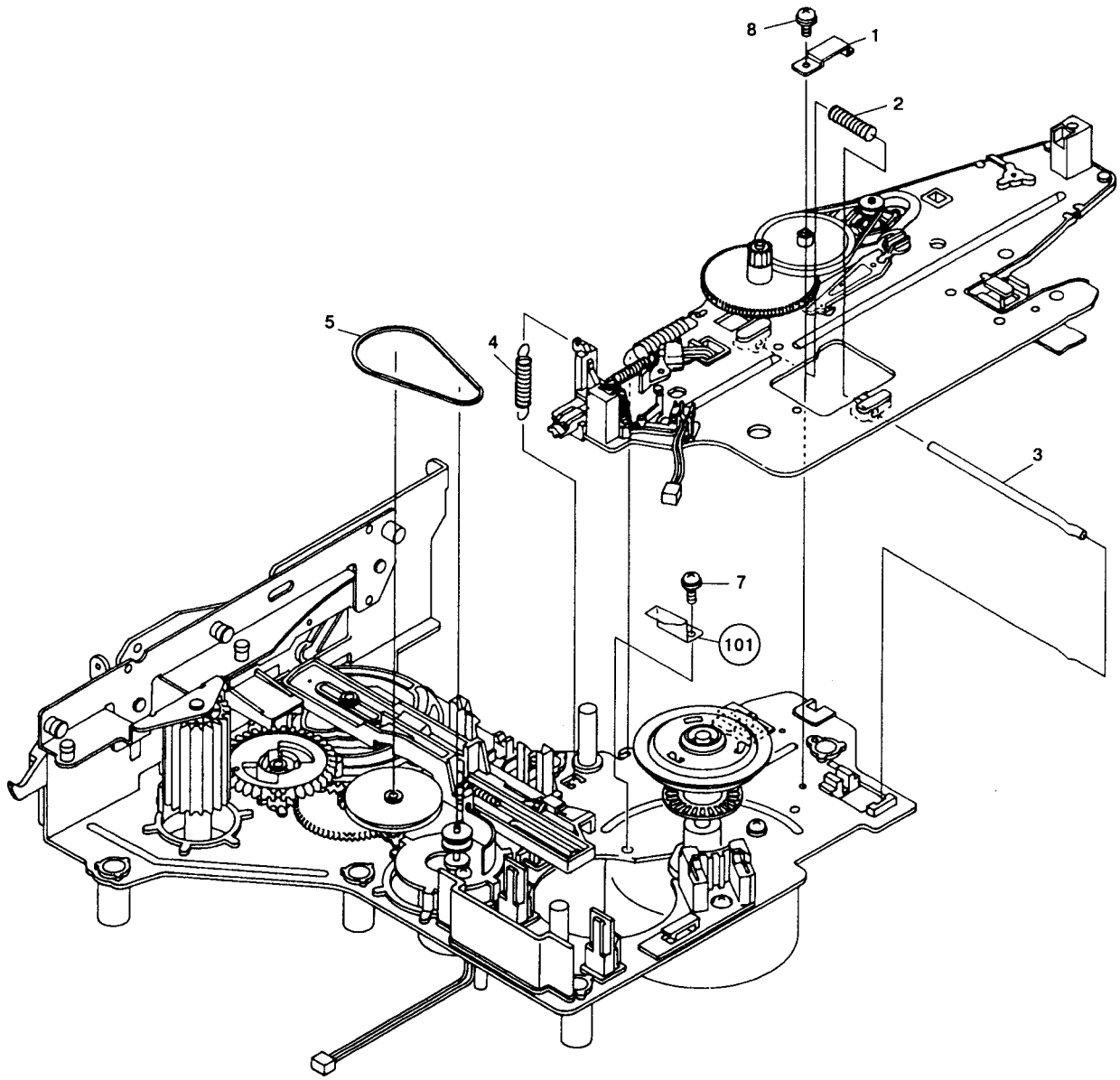
2.5 MECHANISM ASSEMBLY (1)

Parts List

Mark No.	Description	Part No.
1	Plate spring	VBK1013
2	Thrust spring	VBH1073
3	Tilt shaft	VLL1175
4	Tilt pulling spring	VBH1074
5	Belt	PEB1013
6	• • • • •	
7	Screw	PMA30P050FMC
8	Screw	ABZ26P050FMC
101	Cam head stopper	

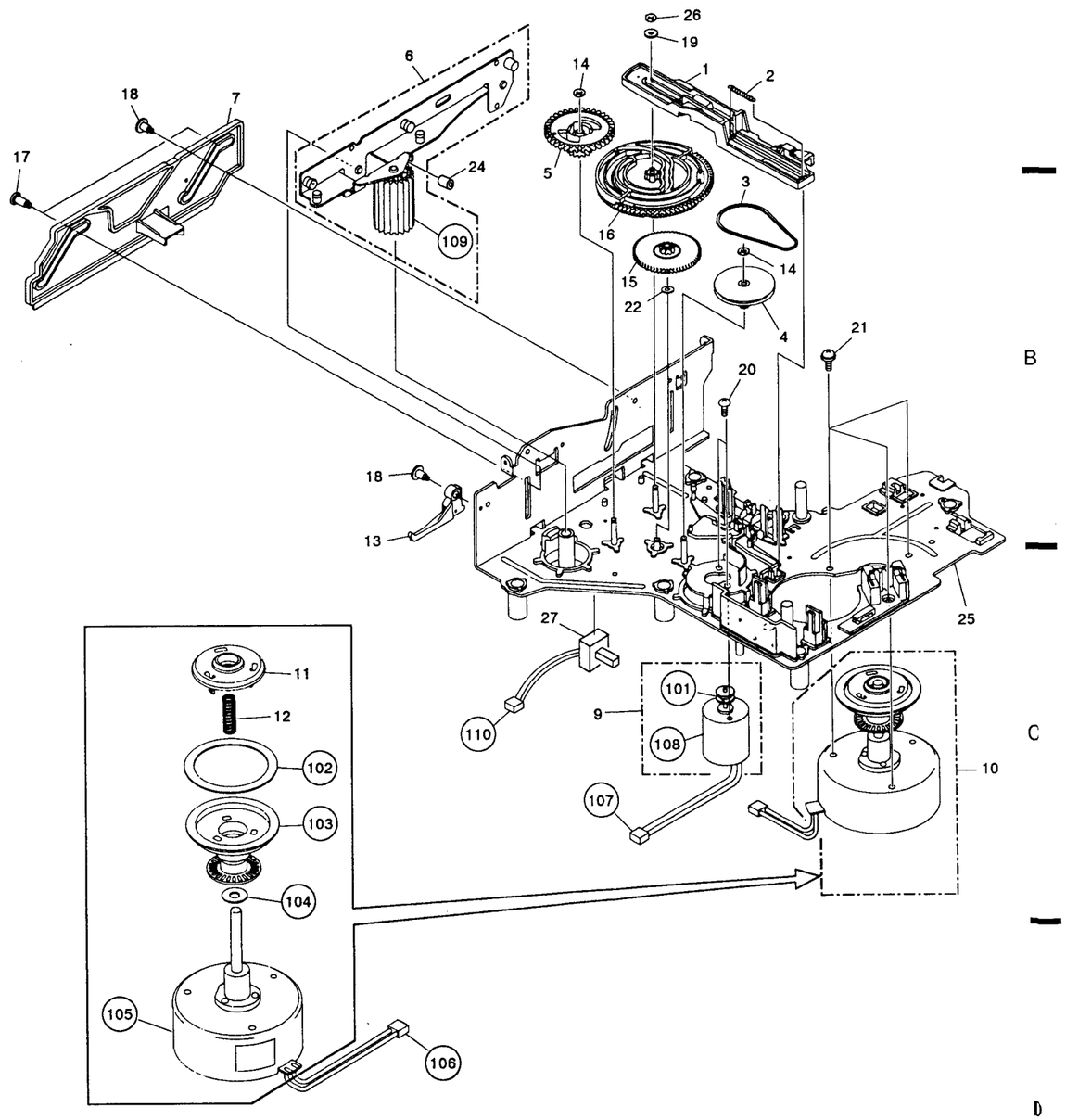


2.6 CHASSIS SECTION

Parts List

Mark	No.	Description	Part No.
	1	Spring slanting cam	VNL1191
	2	Cam spring	VBH1082
	3	Belt	PEB1013
	4	Gear pulley	VNL1249
	5	Follow gear	VNL1194
	6	Roller plate assembly	VXA1531
	7	Slide cam	VNL1188
	8	• • • • •	
	9	Loading motor assembly	VXX1262
	10	Spindle motor assembly	VXA1474
	11	Centering hab	VNL1174
	12	Centering spring	VBH1083
	13	Door lever	VNL1407
	14	Washer	WT26D047D025
	15	Two stair gear	VNL1193
	16	Cam gear	VNL1340
	17	Screw (C)	VBA1015
	18	Screw (B)	VBA1008
	19	Nylon washer	WA32N080W020
	20	Screw	PMZ30P040FMC
	21	Screw	PMA30P050FMC
	22	Washer	WA32D060D025
	23	• • • • •	
	24	Stop ring	VEB1091
◉	25	Chassis assembly	VXA1575
	26	E ring	YE23FUC
	27	Push switch	DSG1014

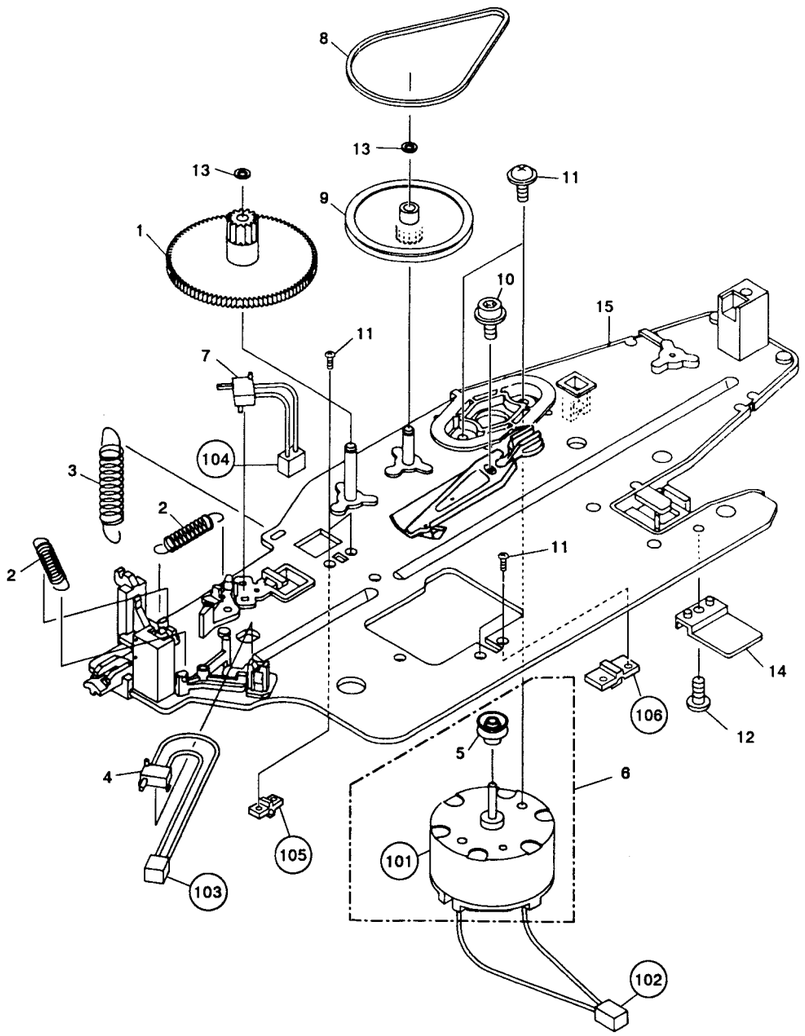
Mark	No.	Description	Part No.
	101	Motor pulley	
	102	Rubber sheet	
	103	Turn table assembly	
	104	Oil stopped washer	
	105	Spindle motor	
	106	Housing assembly	
	107	Housing assembly	
	108	Loading motor	
	109	Slider gear	
	110	Housing assembly	



2.7 SERVO MECHANISM BASE SECTION

Parts List

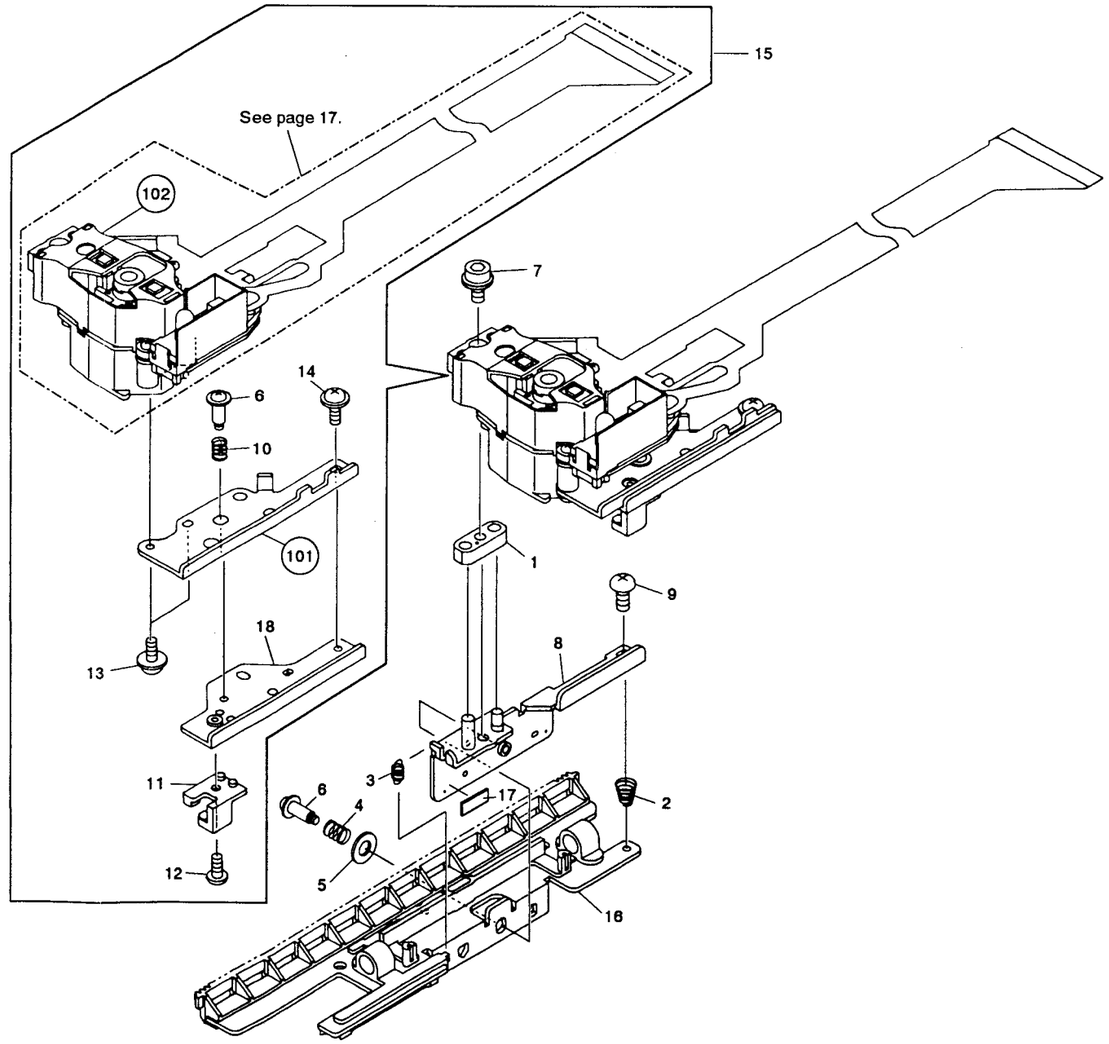
Mark	No.	Description	Part No.
	1	CA gear (3)	VNL1196
	2	Switch pulling spring	VBH1079
	3	TC pulling spring	VBH1080
	4	Push switch (S5:OUTER)	DSG1014
	5	CA pulley (1)	VNL1197
	6	Carriage motor assembly	VXX1261
	7	Push switch (S4:INNER)	DSG1014
	8	CA belt	VEB1077
	9	CA pulley (2)	VNL1198
	10	Screw	SMF30H080FBT
	11	Screw	PMM26P040FMC
	12	Screw	BPZ26P050FMC
	13	Washer	WT26D047D025
	14	FLE base	VNL1341
◉	15	Servo mechanism base assembly - S	VXA1583
	101	Carriage motor	
	102	Housing assembly	
	103	Housing assembly	
	104	Housing assembly	
	105	Holder (A)	
	106	Holder (B)	



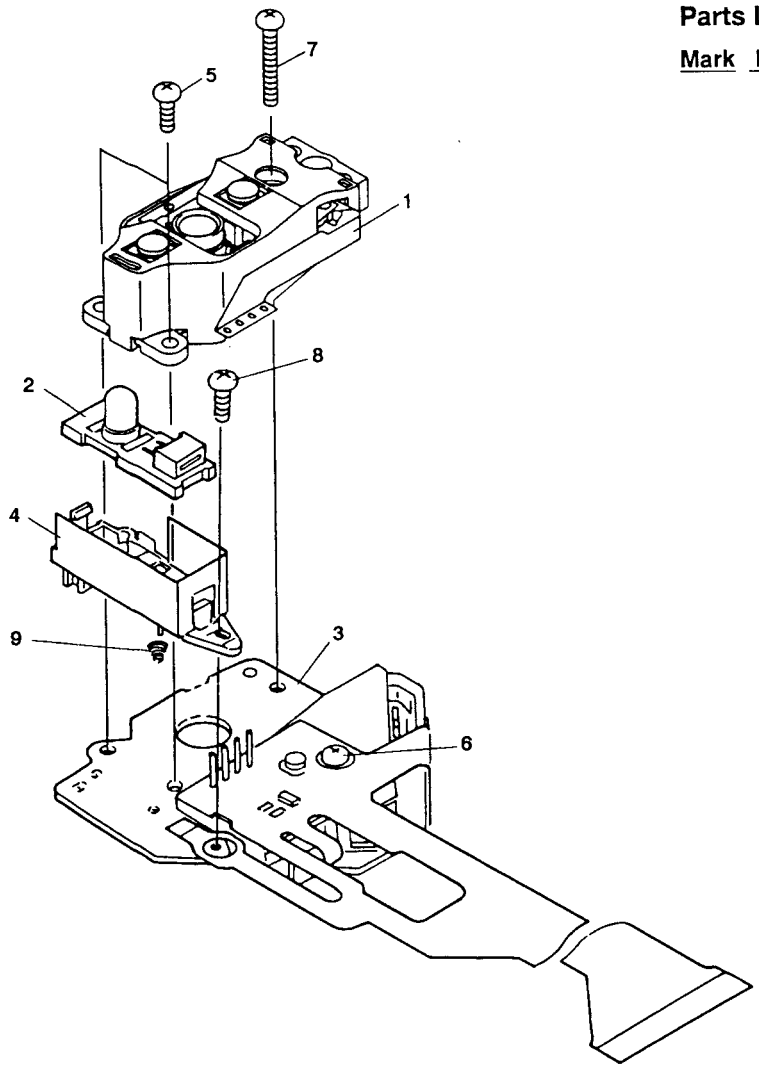
2.8 RACK SECTION

Parts List

Mark	No.	Description	Part No.
	1	PU base	VNL1209
	2	LP center spring	VBH1075
	3	PU pulling spring	VBH1089
	4	L-2 spring	VBH1090
	5	Washer	WC30FMC
	6	Screw	VBA1007
	7	Screw (2.6 × 10)	VLL1192
◉	8	Rack	VNL1186
	9	Screw	BMZ26P080FMC
	10	TAN spring	VBH1081
	11	TAN base	VNL1199
	12	Screw	PMZ20P040FMC
	13	Screw	PMA20P040FMC
	14	Screw	AMZ20P050FMC
	15	Slider assembly	VWT1060
	16	PU mount base assembly	VXA1567
	17	Spacer (S)	VEC1284
	18	TAN plate (1)	VNE1606
	101	TAN plate (2)	
	102	Pickup assembly	



2.9 PICKUP ASSEMBLY



Parts List of Pickup assembly

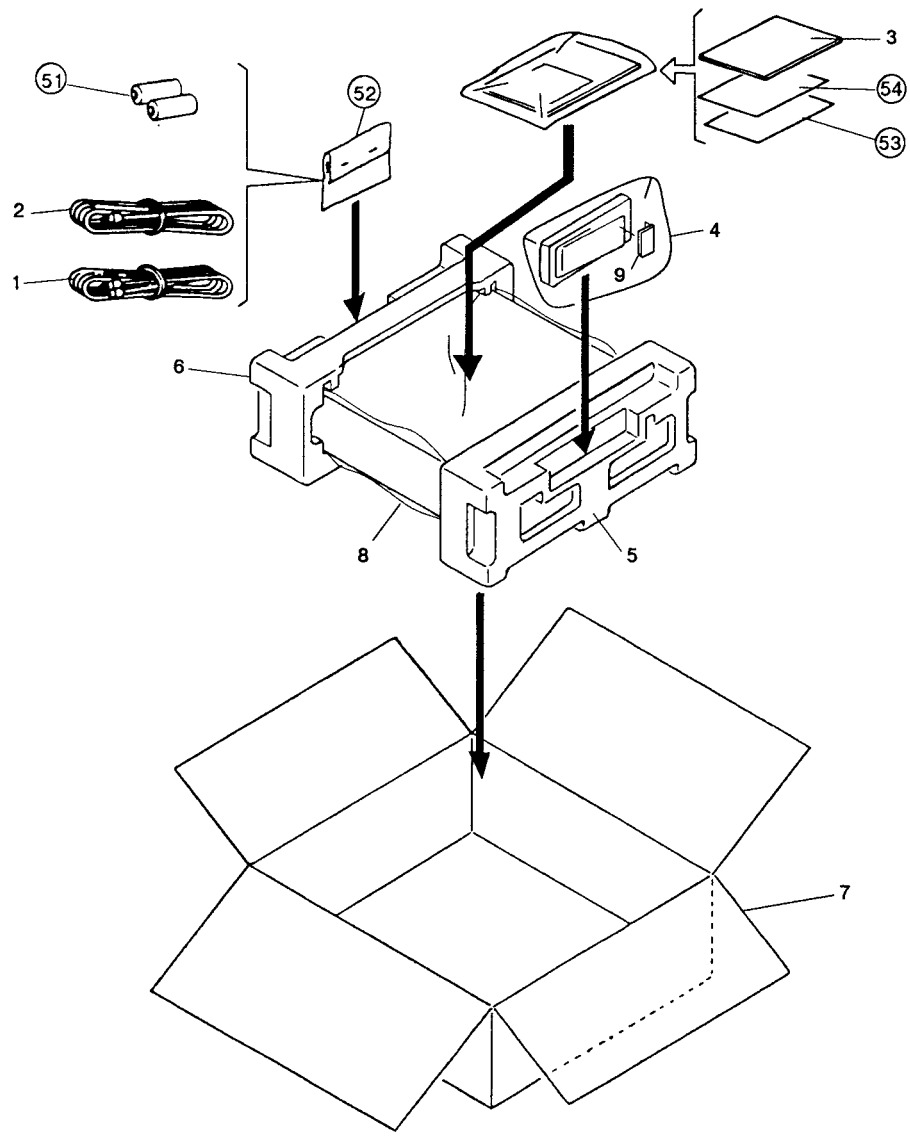
Mark	No.	Description	Part No.
	1	Actuator assembly	VXX1551
	2	Sensor assembly	VEX1018
	3	Pre-pickup assembly	VXX1413
	4	Sensor stay	VNH1024
	5	Screw	PMA20P060FMC
	6	Screw	PMA20P080FMC
	7	Screw	PMA20P140FMC
	8	Screw	BMZ20P060FMC
	9	Sensor spring	VBH1087

3. PACKING

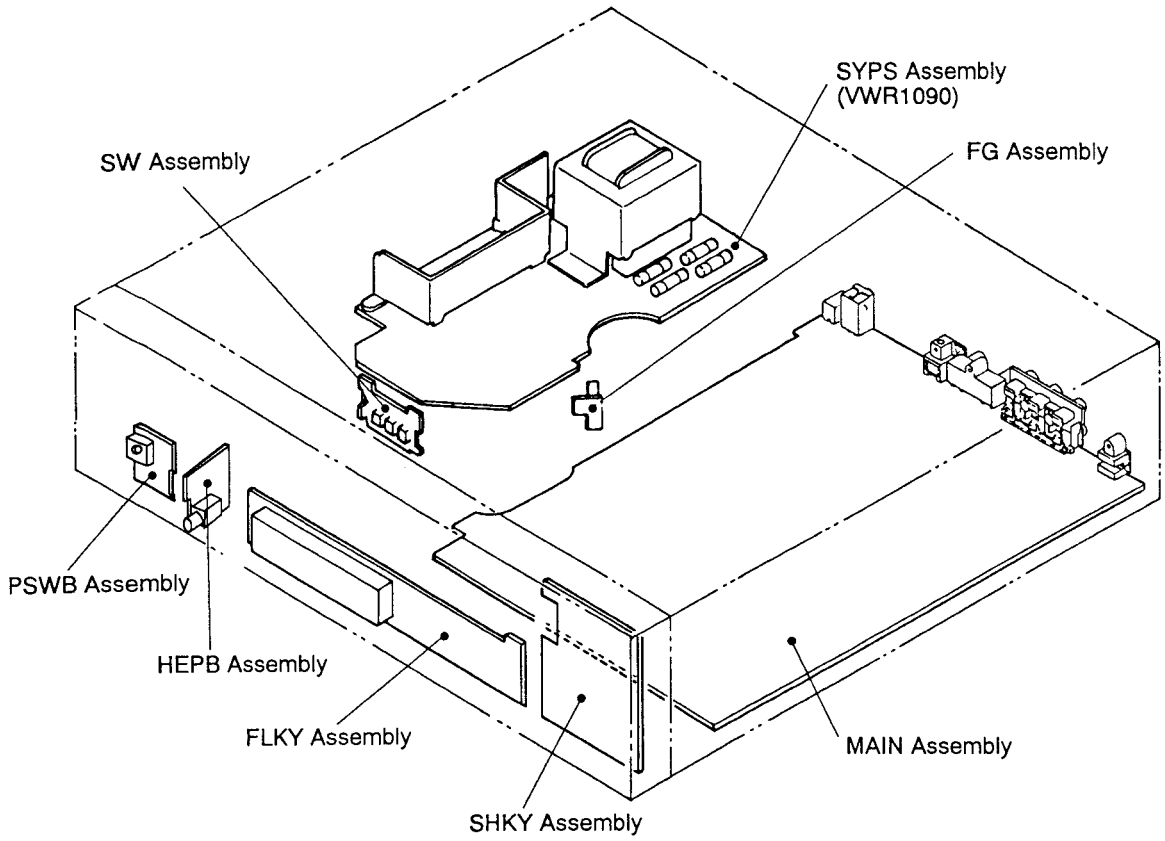
Parts List

Mark	No.	Description	Part No.
	1	Connection cord	VDE-055
	2	Video cable	VDE-056
	3	Operating instructions (English)	VRB1048
	4	Remote control unit	VXX1530
	5	Pad (F)	VHA1076
	6	Pad (R)	VHA1077
	7	Packing case	VHG1143
	8	Mirror mat	VHL1006
	9	Battery cover	VNK1806

Mark	No.	Description	Part No.
	51	Dry cell battery (R03, AAA)	
	52	Polyethylene bag	
	53	Caution card	
	54	Caution card (UC)	



4. P. C. BOARDS LOCATION



MOTHER ASSEMBLY (VWM1159)

MOTHER assembly is composed of MAIN, FG and SW assemblies.

FLKB ASSEMBLY (VWM1160)

FLKB assembly is composed of FLKY, SHKY, PSWB and HEPB assemblies.

MAIN	: **MAIN** BOARD
FG	: **FG** COUNTER BOARD
SW	: **SW** BOARD
FLKY	: **FL** TUBE AND **KEY** BOARD
SHKY	: **SH**UTTLE AND **KEY** BOARD
PSWB	: **P**OWER **SW**ITCH **B**OARD
HEPB	: **HEADP**HONE **B**OARD
SYPS	: **SY**STEM **P**OWER **S**UPPLY

5.SCHEMATIC AND P.C. BOARDS DIAGRAM

1. RESISTORS:
   Indicated in Ω , 1/4W, 1/6W and 1/8W, ±5% tolerance unless otherwise noted k;k Ω , M;M Ω , (F); ± 1%, (G); ± 2%,(K); ± 10%, (M); ± 20% tolerance.

2. CAPACITORS:
   Indicated in capacity (μF) / voltage(V)unless otherwise noted p;pF. Indication without voltage is 50V except electrolytic capacitor.

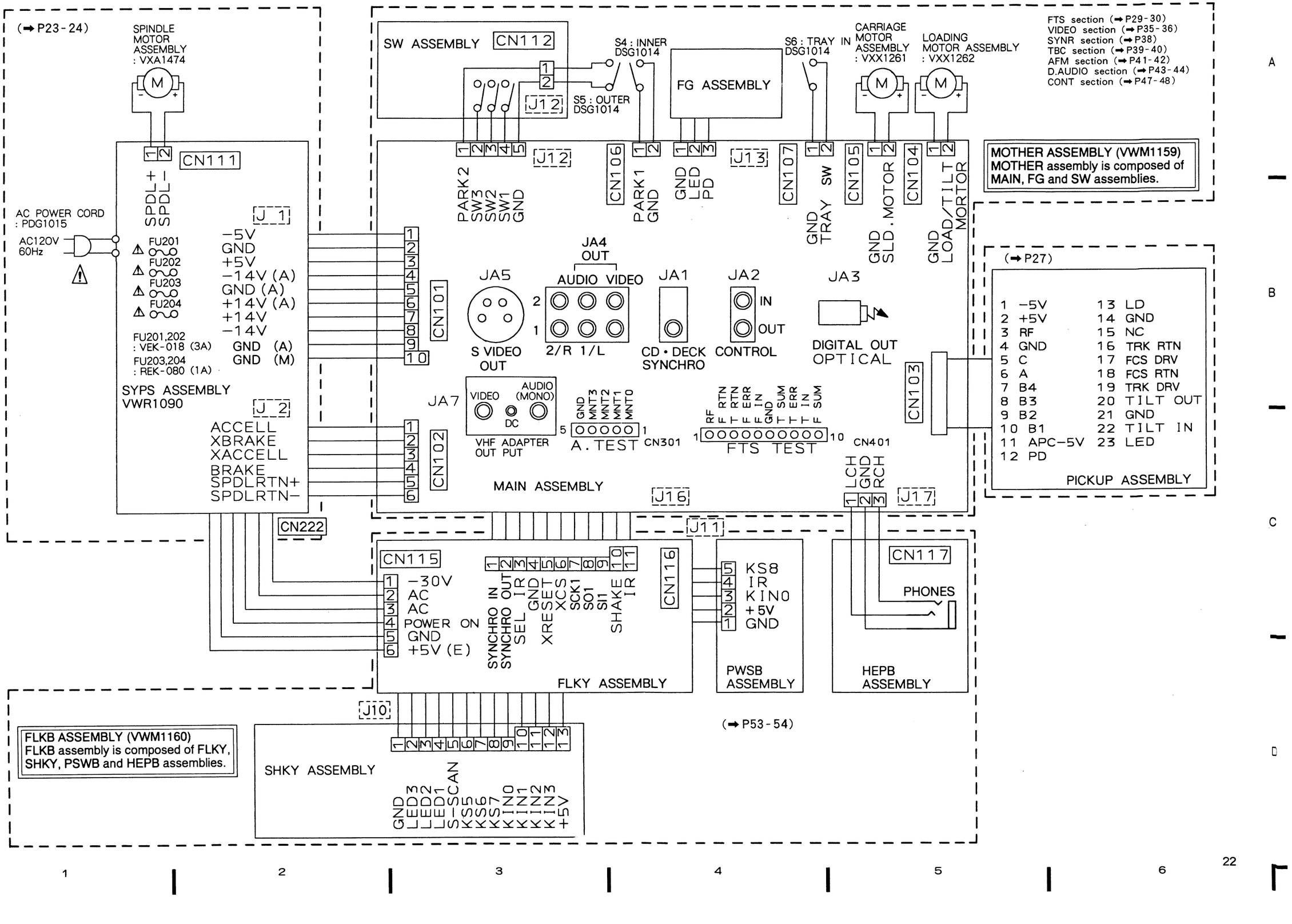
3. VOLTAGE, CURRENT:
   ▭ ;DC voltage (V) at no input signal.
   Value in ( ) is DC voltage at rated power.
   ⇦ mA ;DC current at no input signal.

4. OTHERS:
   ➡ ;Signal route.
   ⊘ ;Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
   ※ marked capacitors and resistors have parts numbers.

   This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. SWITCHES :(The underlined indicates the switch position)
   OUTSIDE OF P.C. BOARDS
   S4 :INNER
   S5 :OUTER
   S6 :TRAY IN
   SW ASSEMBLY
   S1-S3 :LOADING / TILT
   FLKY ASSEMBLY
   S10 :PGM
   S11 :5
   S12 :0
   S13 :+10
   S14 :2
   S15 :1
   S16 :4
   S17 :3
   S18 :9
   S19 :8
   S20 :7
   S21 :6
   S22 :DIRECT CD
   S23 :SINGLE
   S24 :DOOR
   SHKY ASSEMBLY
   S40 :DIGITAL LEVEL CTRL
   S41 :PGM EDIT
   S42 :PEAK SEARCH
   S43 :RANDOM PLAY
   S44 :HILITE INTRO SCAN
   S45 : |◀◀
   S46 : ▶▶|
   S47 :OPEN / CLOSE (▲)
   S48 :STOP (■)
   S49 :PLAY / PAUSE (▶ / ❙❙)
   S51 :SCAN / LEVEL (◀◀ / ▶▶)
   PSWB ASSEMBLY
   S60 :POWER

5.1 OVERALL WIRING DIAGRAM



5.2 SYPS ASSEMBLY

Q201, Q204,
Q206 : 2SD1762
Q202, Q203,
Q205 : 2SB1185
Q207 : 2SB1238X
Q214, Q219 : 2SA933S
Q213 : DTC114ES
Q218 : 2SC1740S
Q217 : DTA114ES

IC201,202 : ICP-N15
IC206 : ICP-N25
IC205 : NJM78M05FA

D101, 103 MTZJ5.6B
D102, 104 MTZJ5.1C
D201, D202 : S2VB20
D208, D209,
D216, D217 : 1SS252
D213, D214,
D222, D223 : 1SR35-100AVL
D212, D215 : 10ELS2
D220 : MTZJ22C
FU201,FU202 : VEK-018
FU203,FU204 : REK-080

SYPS ASSEMBLY (VWR1090)

CAUTION :FOR CONTINUED PROTECTION AGAINST RISK OF FIRE REPLACE WITH SAME TYPE NO. ICP-N15 MFD BY ROHM CO.LTD. FOR IC201,AND IC202.

CAUTION :FOR CONTINUED PROTECTION AGAINST RISK OF FIRE REPLACE WITH SAME TYPE NO. ICP-N25 MFD BY ROHM CO.LTD. FOR IC206.

Q207 : +28V REGULATOR

IC205 : EVER +5V REGULATOR

POWER TRANSFORMER : VTT1079

RCG-009

AC120V 60Hz

AC POWER CORD : PDG1015

L202 VTL-262

C205,C206 : VCH1095

IC201 : IC PROTECTOR
IC202 : IC PROTECTCR

Q203-206 : SPDL MOTOR DRIVE

Q202 : +5V REGULATOR

Q201 : -5V REGULATOR

Q214,218,219 : POWER ON SW

Q213 : +5V SW

VTL1008 L201

SPINDLE MOTOR ASSEMBLY : VXA1474

CN222

6	+5V (E)
5	GND
4	POWER ON
3	AC
2	AC
1	-30V

TO FLKY ASSEMBLY CN115 (➡P53)

J1

10	GND (M)
9	GND (A)
8	-14V
7	+14V
6	AUDIO +14V
5	AUDIO GND
4	AUDIO -14V
3	+5V
2	GND
1	-5V

TO MAIN ASSEMBLY (FTS SECTION) CN101 (➡P29)

J2

1	ACCELL
2	X-BRAKE
3	X-ACCELL
4	BRAKE
5	SPDL RTN+
6	SPDL RTN-

TO MAIN ASSEMBLY (TBS SECTION) CN102 (➡P39)

CN111 SPDL-, SPDL+

+14V (SPDL)

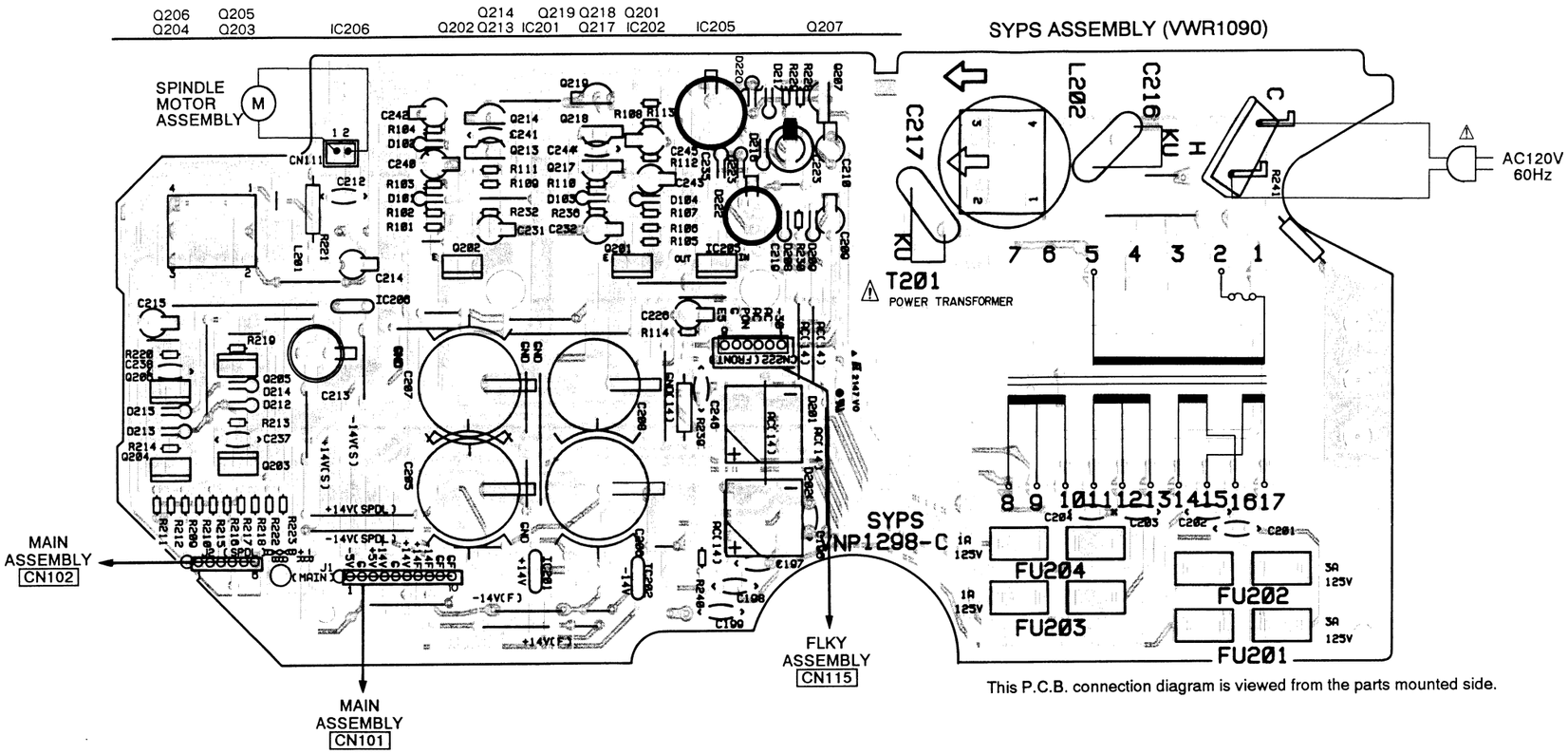
-14V (SPDL)

+14V

-14V

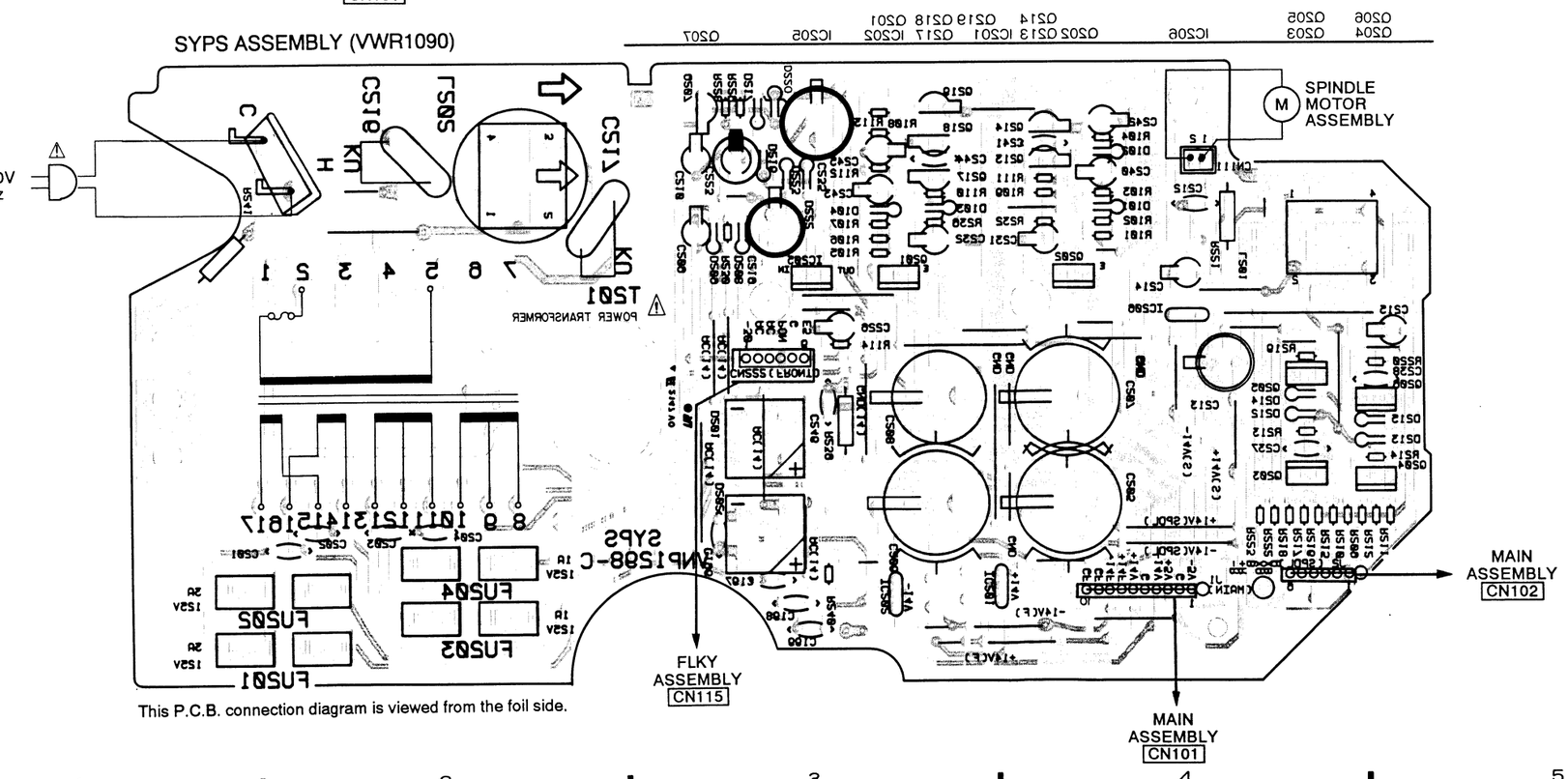
:SPDL Servo Loop Line

SYPS ASSEMBLY (VWR1090)



This P.C.B. connection diagram is viewed from the parts mounted side.

SYPS ASSEMBLY (VWR1090)

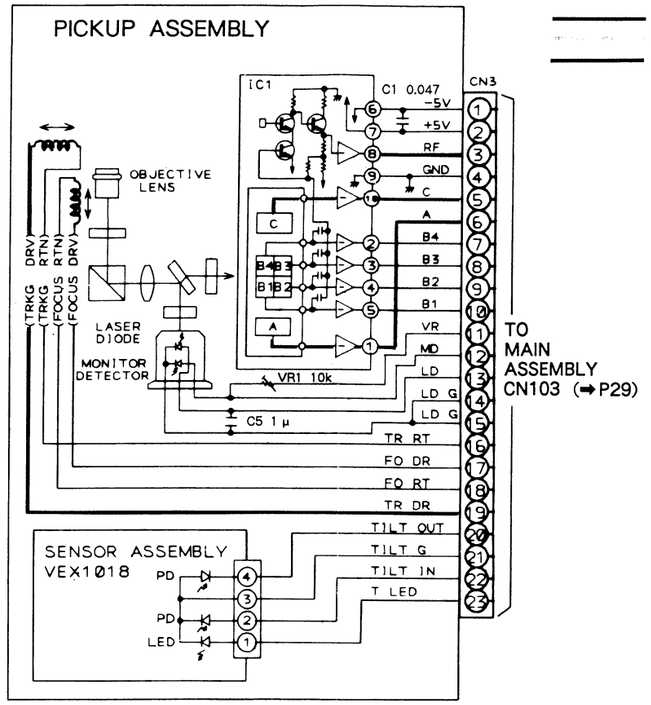


This P.C.B. connection diagram is viewed from the foil side.

P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor
		FET
		Diode
		Zenner diode
		LED
		Varactor
		Tact switch
		Inductor
		Coil
		Transformer
		Filter
		Ceramic capacitor
		Mylar capacitor
		Styrol capacitor
		Electrolytic capacitor (Non polarized)
		Electrolytic capacitor (Noiseless)
		Electrolytic capacitor (Polarized)
		Electrolytic capacitor (Polarized)
		Power capacitor
		Semi-fixed resistor
		Resistor array
		Resistor
		Resonator
		Thermistor

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

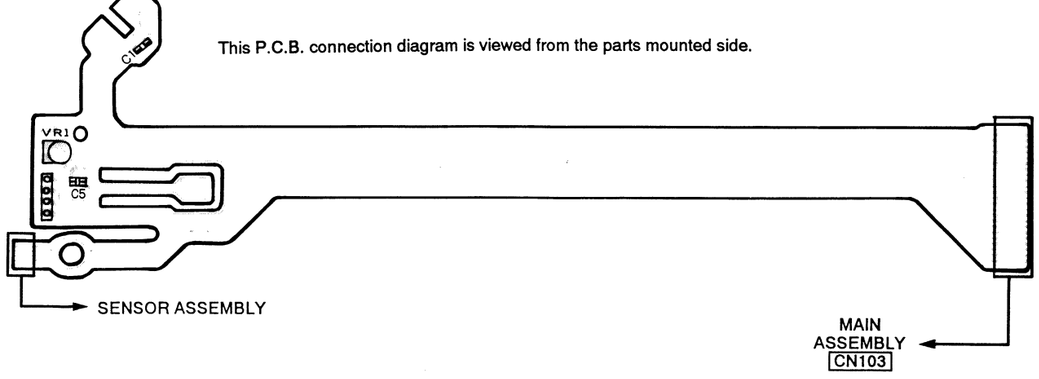
5.3 PICKUP ASSEMBLY

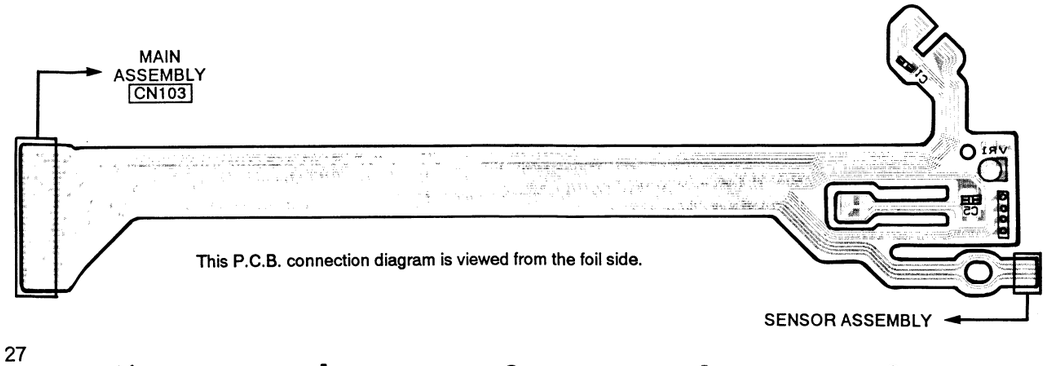


:RF Signal Route
:FOCS Servo Loop Line
:TRKG Servo Loop Line

HEAD ASSEMBLY

This P.C.B. connection diagram is viewed from the parts mounted side.





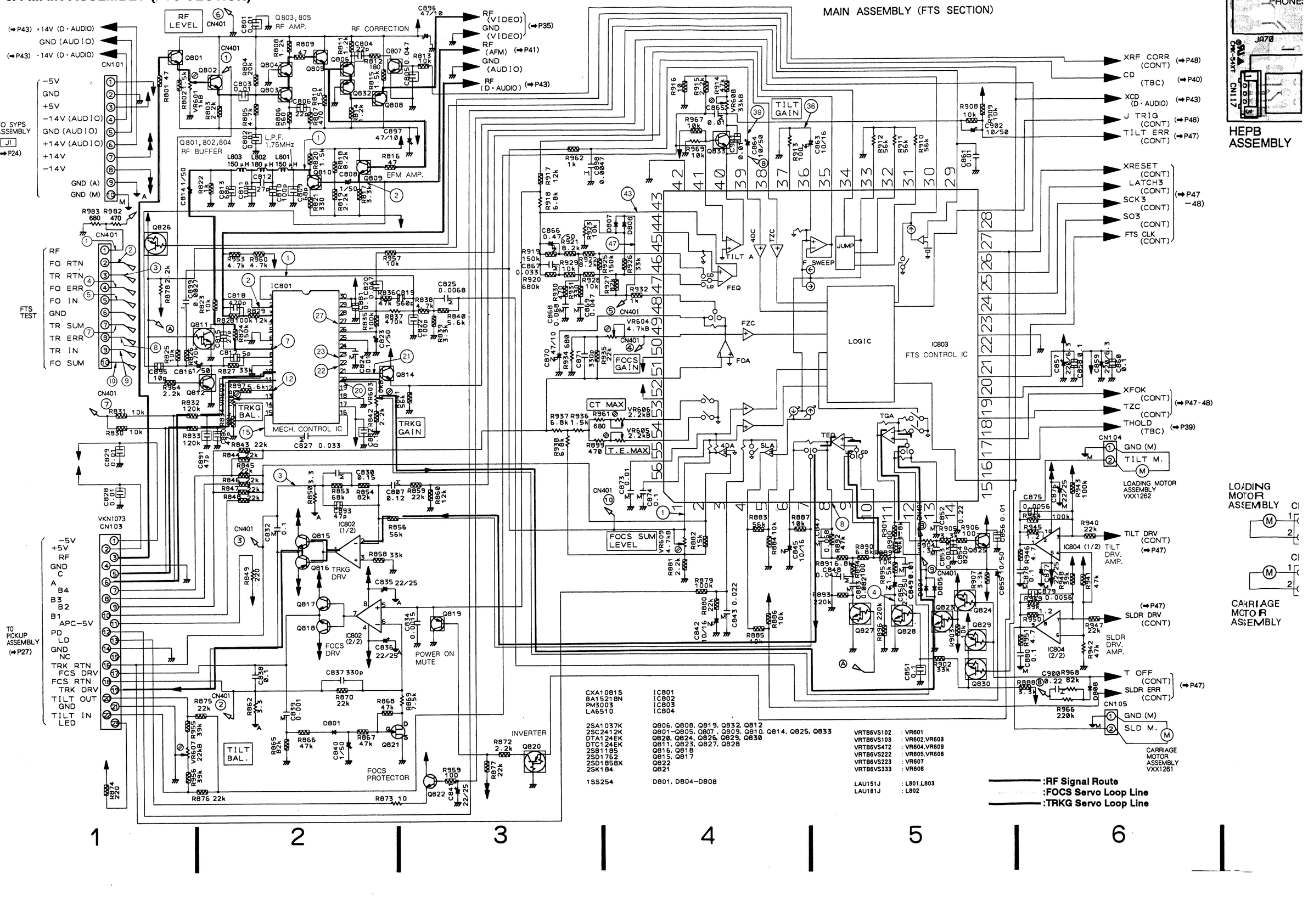
This P.C.B. connection diagram is viewed from the foil side.

FTS SECTION

IC801 (CXA1081S)	CN401			IC803 (PM3003)	Other Points
① 1.5Vp-p	⑳ 400mVp-p	① 300mVp-p	⑦ 100mVp-p	① 300mVp-p	① Q810 collector 400mVp-p
② 300mVp-p	㉑ 700mVp-p	② 5Vp-p	⑧ 1.25Vp-p :at closed	⑧ 2Vp-p	② Q809 Emitter 2Vp-p
⑦ 40mVp-p	㉒ 7Vp-p	③ 4Vp-p	⑨ 1.25Vp-p	㊱ 2Vp-p	③ Betweem C830 and C832 200mVp-p
⑫ 350mVp-p	㉓ 2Vp-p	④ 1.5Vp-p	⑩ 2Vp-p	㊴ 1Vp-p	④ Q828 collector 400mVp-p
⑮ 400mVp-p	㉗ 3Vp-p	⑤ 1.5Vp-p		㊸ 500mVp-p	
				㊼ 150mVp-p	

5.4 MAIN ASSEMBLY (FTS SECTION)

MAIN ASSEMBLY (FTS SECTION)



7 8 9 10 11 12

A B C D

PHONES
JA70
VR70
CN117
HEPB ASSEMBLY

TP901 VR601 VR602 VR605 VR603 VR606 VR609 VR607 VR604 VR608 VR521 VR482 VR441 TP101 VR481 VC901

DIGITAL AUDIO
ANALOG AUDIO
VIDEO
CCD
TBC
FTS
MAIN ASSEMBLY

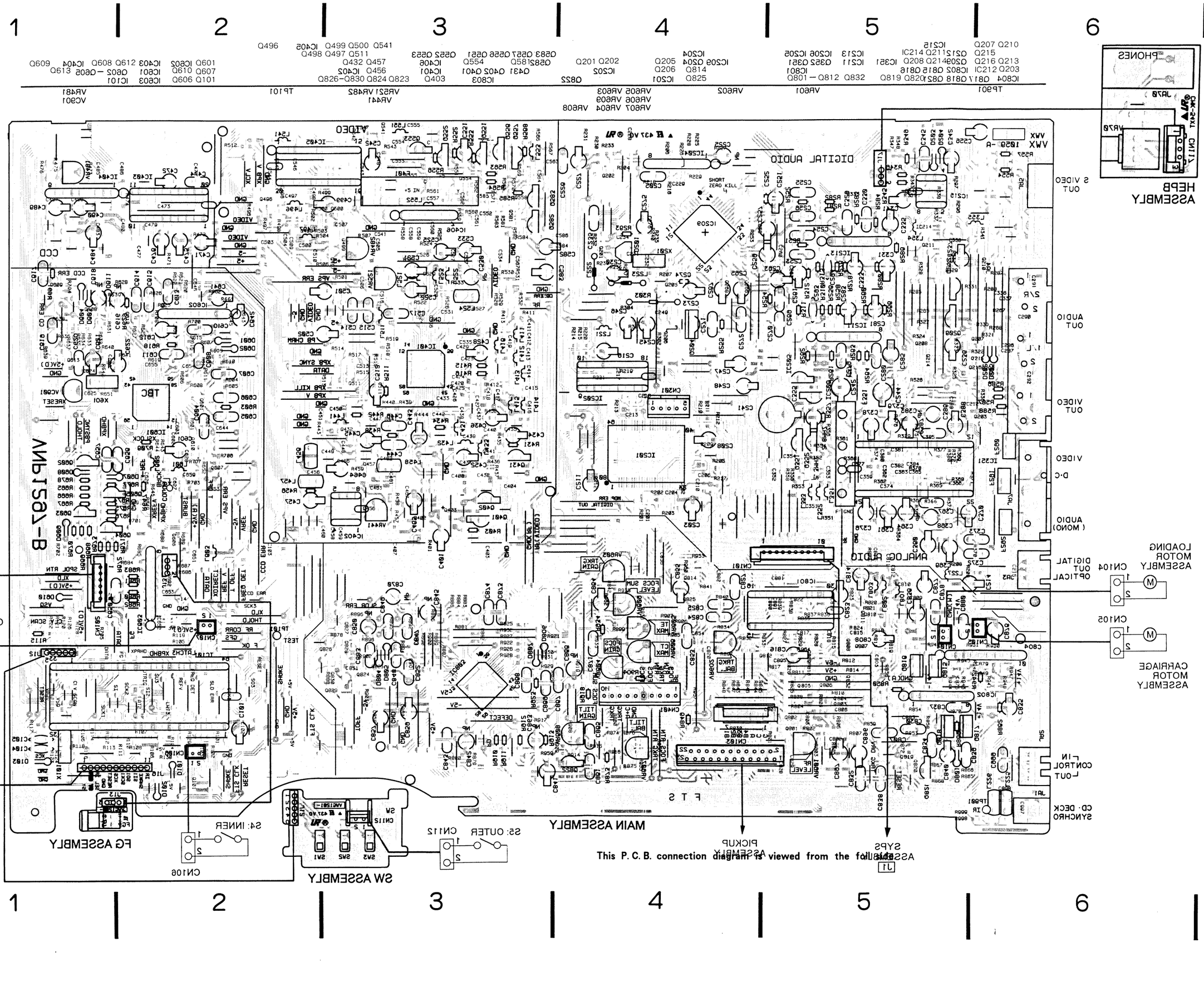
S VIDEO OUT
AUDIO OUT
VIDEO OUT
VIDEO
D·C
AUDIO (MONO)
DIGITAL OUT OPTICAL
IN CONTROL OUT
CD· DECK SYNCHRO

LOADING MOTOR ASSEMBLY
CN104
CN105
CARRIAGE MOTOR ASSEMBLY

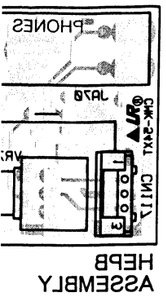
SYPS ASSEMBLY J1
PICKUP ASSEMBLY
SYPS ASSEMBLY J2
CN107 S6: TRAY IN
FLKY ASSEMBLY CN116
S5: OUTER CN112
SW CN112
SW3 SW2 SW1
SW ASSEMBLY
S4: INNER
CN106
FG ASSEMBLY

VNP1297-B

(⇒P48) (⇒P40) (⇒P43) (⇒P48) (⇒P47) (⇒P47 −48) (⇒P47-48) (⇒P39) (⇒P47)


VNP1201-B
MAIN ASSEMBLY
SW ASSEMBLY
FG ASSEMBLY
SYPS ASSEMBLY
PICKUP ASSEMBLY
FLKY ASSEMBLY
LOADING MOTOR ASSEMBLY
CARRIAGE MOTOR ASSEMBLY
HEPB ASSEMBLY
CD · DECK SYNCHRO
LINE CONTROL OUT
DIGITAL OUT OPTICAL
ANALOG AUDIO
DIGITAL AUDIO
AUDIO OUT
VIDEO OUT
S VIDEO OUT
AUDIO (MONO)
CN104
CN105
CN106
CN107
CN112
CN113
CN116
CN118
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
SW11
SW12
SW13
SW14
SW15
SW16
SW17
SW18
SW19
SW20
SW21
SW22
SW23
SW24
SW25
SW26
SW27
SW28
SW29
SW30
SW31
SW32
SW33
SW34
SW35
SW36
SW37
SW38
SW39
SW40

5.5 MAIN ASSEMBLY (VIDEO SECTION)



MAIN ASSEMBLY (VIDEO SECTION)

(➡P48) DIRECT (CONT)

(➡P29) (FTS) RF

Q431 :VIDEO BUFFER

Q432 :VIDEO BUFFER

L.P.F.

B.P.F

IC401 PA5013A :VIDEO PROCESSOR

IC402 :1H DELAY LINE

IC402 PM0001

Q456 :VIDEO BUFFER

Q457 :VIDEO BUUFFER

1H DLY VIDEO LEVEL

X 1/2

CCD 112 STAGES

IC404 PA0017

(➡P47) FREQ DET (CONT) REF SC (TBC) (➡P36)

(➡P39) CCD ERR (TBC)

IC403 : CCD

IC403 CXL1009P

IC404 : CCD CLOCK VCO

VCO CENTER FREQ.ADJ.

XPB V (TBC) (➡P39)
XPB V (CONT)
DATA (CONT) (➡P48)
XPB SYNC (TBC)
PB CHRM (TBC)
VPS ERR (TBC) (➡P39)

Q496 :VIDEO BUFFER

Q497 :VIDEO BUFFER

VIDEO LEVEL

Q511 : SYNC BUFFER

Q500 :VIDEO BUFFER

Q498,499 :L.P.F for SYNC SEP.

Q582 :VIDEO DRIVE

Q583 :VIDEO DRIVE

Q581 :VIDEO BUFFER

JA4 VKB1030

VIDEO OUT

VIDEO (D+AUDIO) (➡P43)

2SA1037K Q 457 496 511 581
2SB1237K Q 401
2SC2412K Q 432 456 497 498 499 500 541
2SC1740S Q 431 502 583
2SD1858K Q 402
DTA124EK Q 403

VR521 : VRTG6VS472
L411,416 : LAU330J
L412,413,523 : LAU220J
L414,415,521 : LAU120J
L431 : LAU430J
L432 : LAU620J
L433 : LAU390J

L441 : LAU270J
L456 : LFA471J
L457,458 : LFA221J
L496 : LAU180J
L497 : LAU181J
L511 : LAU820J
L522 : LAU560J
L524 : LFA561K
L541 : LAU470J

VIDEO FROM SYNR
VIDEO FOR SYNR (➡P38)

(➡P39-40) (CONT) CAV/XCLV (DOC INH HI-Z) XREF XB HD XREF CBLBAK

(➡P47-48) XRESET XCS SCK SIN CLV SCN CLV SCAN

IC405 PD0070

IC405 : CHARACTER GENERATOR

:RF Signal Line
:Video Signal Line

WAVEFORMS OF THE VIDEO SECTION

IC401 (PA5013A)

① 2Vp-p	⑭ 600mVp-p	㉙ 1.25Vp-p	㊻ 1Vp-p	⑨ approx. 300mVp-p	㉖ 5Vp-p
③ 2Vp-p	⑮ 200mVp-p	㉛ 700mVp-p			㉗ 5Vp-p
④ approx. 1Vp-p	⑯ 63.5μS	㉜ 4Vp-p 17.5mS			
⑤ approx. 1Vp-p	⑰ 4Vp-p 63.5μS	㉝ approx. 600mVp-p	⑤ 600mVp-p	⑤ 4Vp-p	
⑥ 2Vp-p	⑲ 2.5Vp-p	㉞ 2.5Vp-p	⑧ 0.3μS 450mVp-p	⑮ 1.25Vp-p	① RF (R411 and R413) approx. 2Vp-p
⑦ 2Vp-p	㉓ 5Vp-p 63.5μS	㉟ 700mVp-p		⑰ 1.25Vp-p	② Q432 Emitter approx. 1.25Vp-p
⑩ 500mVp-p	㉔ 4Vp-p	㊴ approx. 1.2Vp-p	① approx. 1.5Vp-p	⑲ 1Vp-p	③ + side of C499 1.25Vp-p
⑪ 1V/div 2mS/div	㉕ 5Vp-p	㊹ 300mVp-p 17.5mS	④ approx. 1.5Vp-p	㉕ 5Vp-p	④ VIDEO OUT terminal 1.2Vp-p

IC404 (PA0017)

IC402 (PM0001)

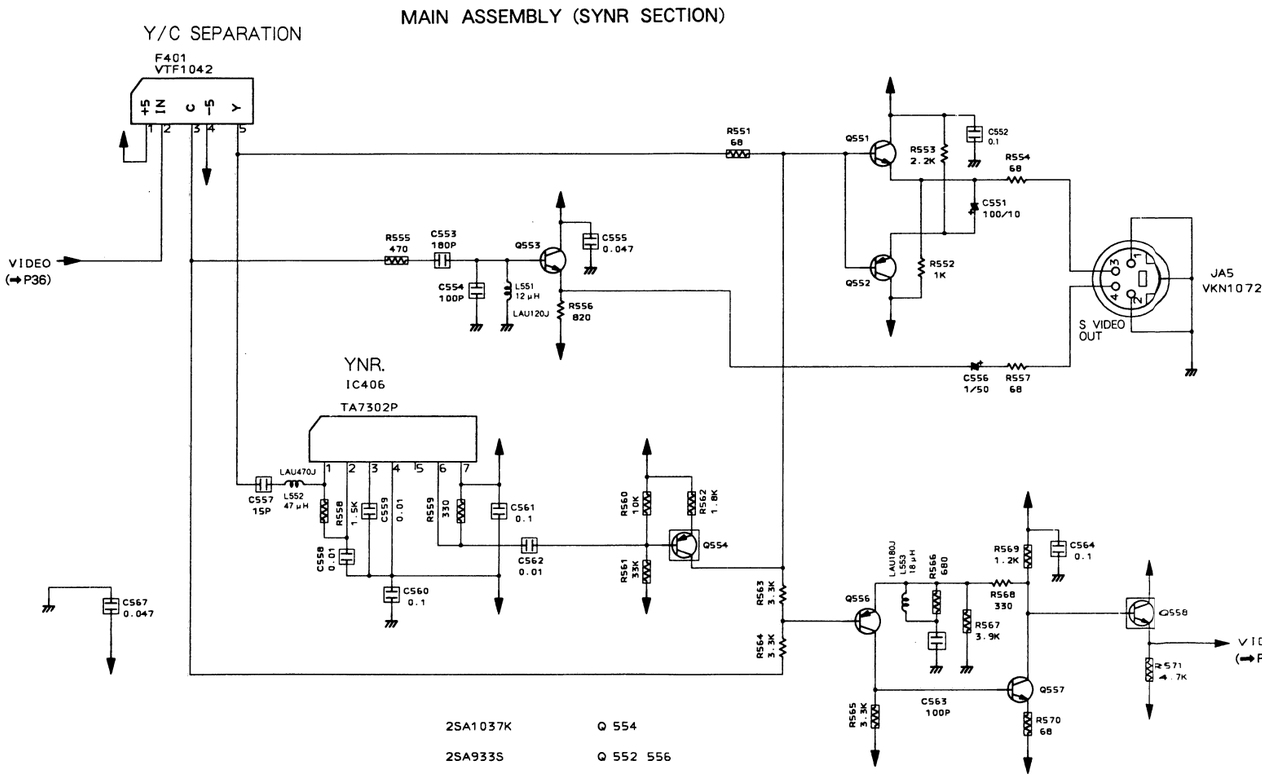
IC405 (PD0070)

Other Points

IC403 (CXL1009)

5.6 MAIN ASSEMBLY (SYNR SECTION)

MAIN ASSEMBLY (SYNR SECTION)



5.7 MAIN ASSEMBLY (TBC SECTION)

MAIN ASSEMBLY (TBC SECTION)

LOGIC BLOCK
SSG
REF H GEN
REF SC GEN
PBH TIMING GEN
LOCK DETECTOR

PFC

:TBC SERVO SYNC GEN.

SPINDLE DRIVE LOGIC

S-P DECORDER

IC602 (1/2) : V REF. GEN.

IC602 (2/2) : CCD ERR. AMP.

IC603 (1/2) : SPDL RTN AMP.

IC603 (2/2) : FG AMP.

Q602-605 :SPDL PRE DRIVE

Q606 : FG IN

FG ASSEMBLY

IC601 : PM3002
IC602 : NJM4558S
IC603 : NJM4558S

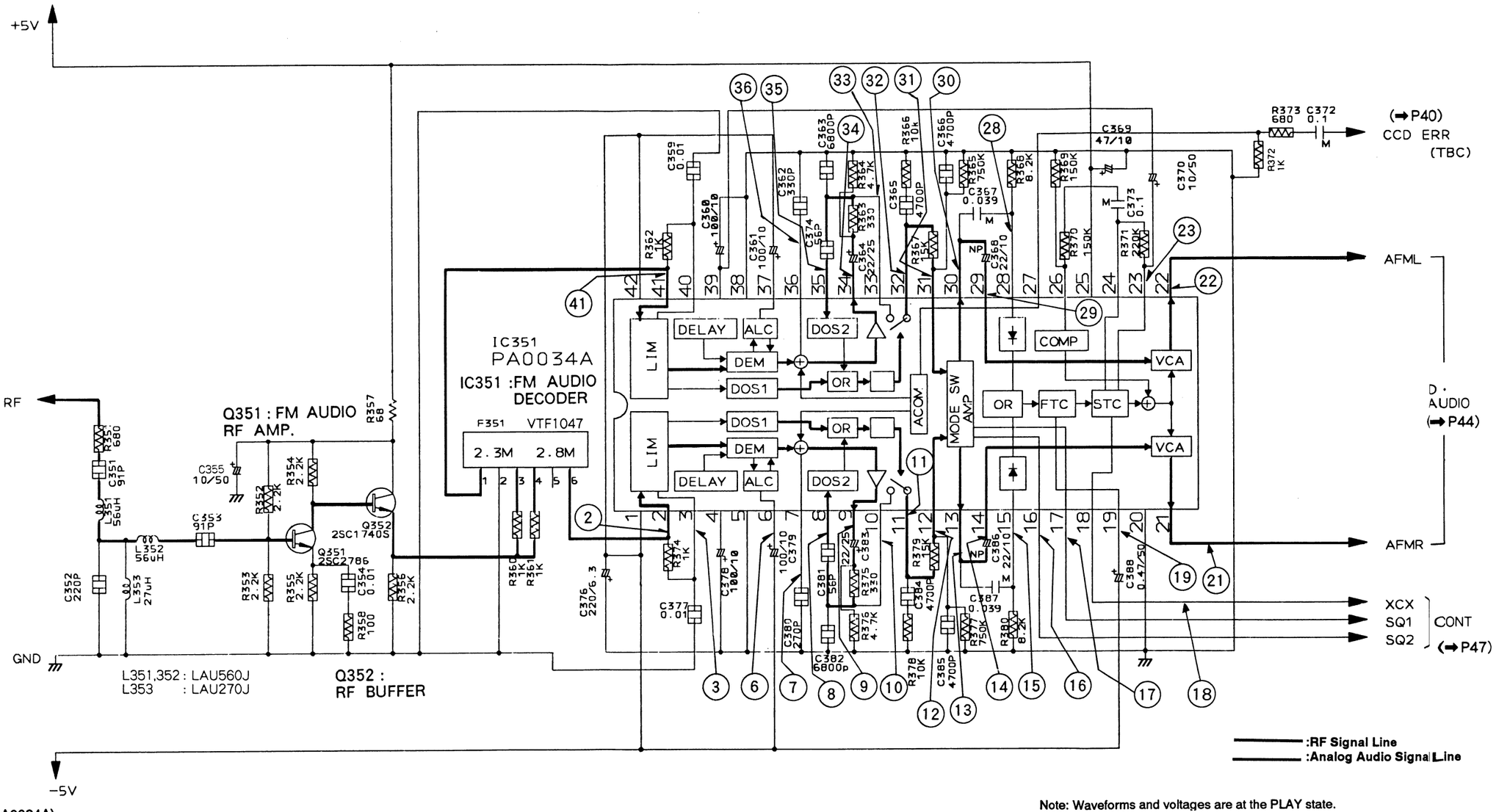
Q602, 604	: 2SC1740S
Q603, 605	: 2SA933S
Q607, 610, 612	: 2SC2412K
Q609	: 2SA1037K
Q606, 608	: DTC124EK
Q613	: DTA124EK
Q601	: FMW2
D601-604, 607-611	: 1SS254

VC901 : VCM-008
X601 : VSS102F
L601,602 : LAU101J
L603 : LAU470J

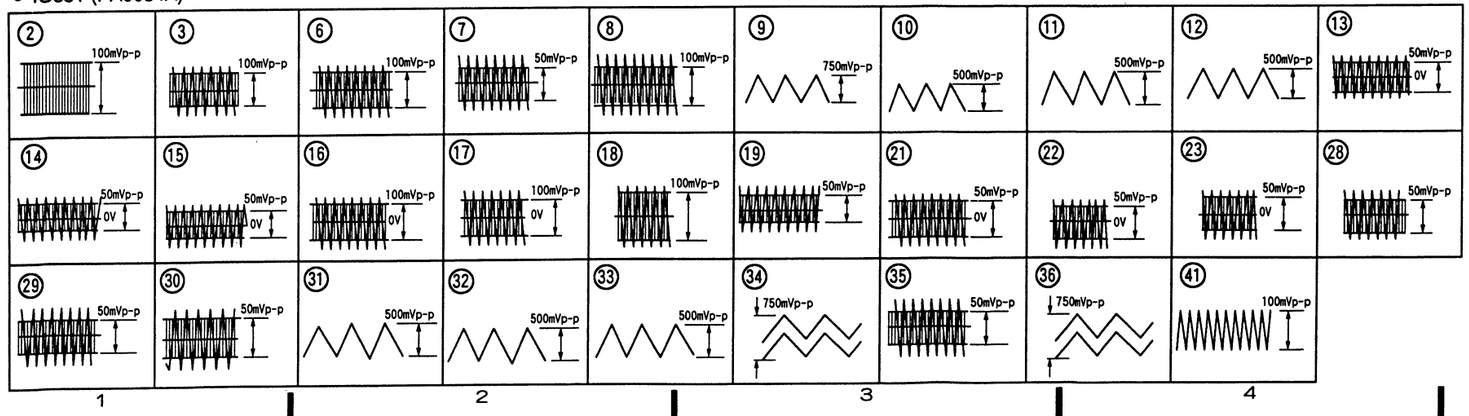
:SPDL Servo Loop Line

5.8 MAIN ASSEMBLY (AFM SECTION)

MAIN ASSEMBLY (AFM SECTION)



● IC351 (PA0034A)



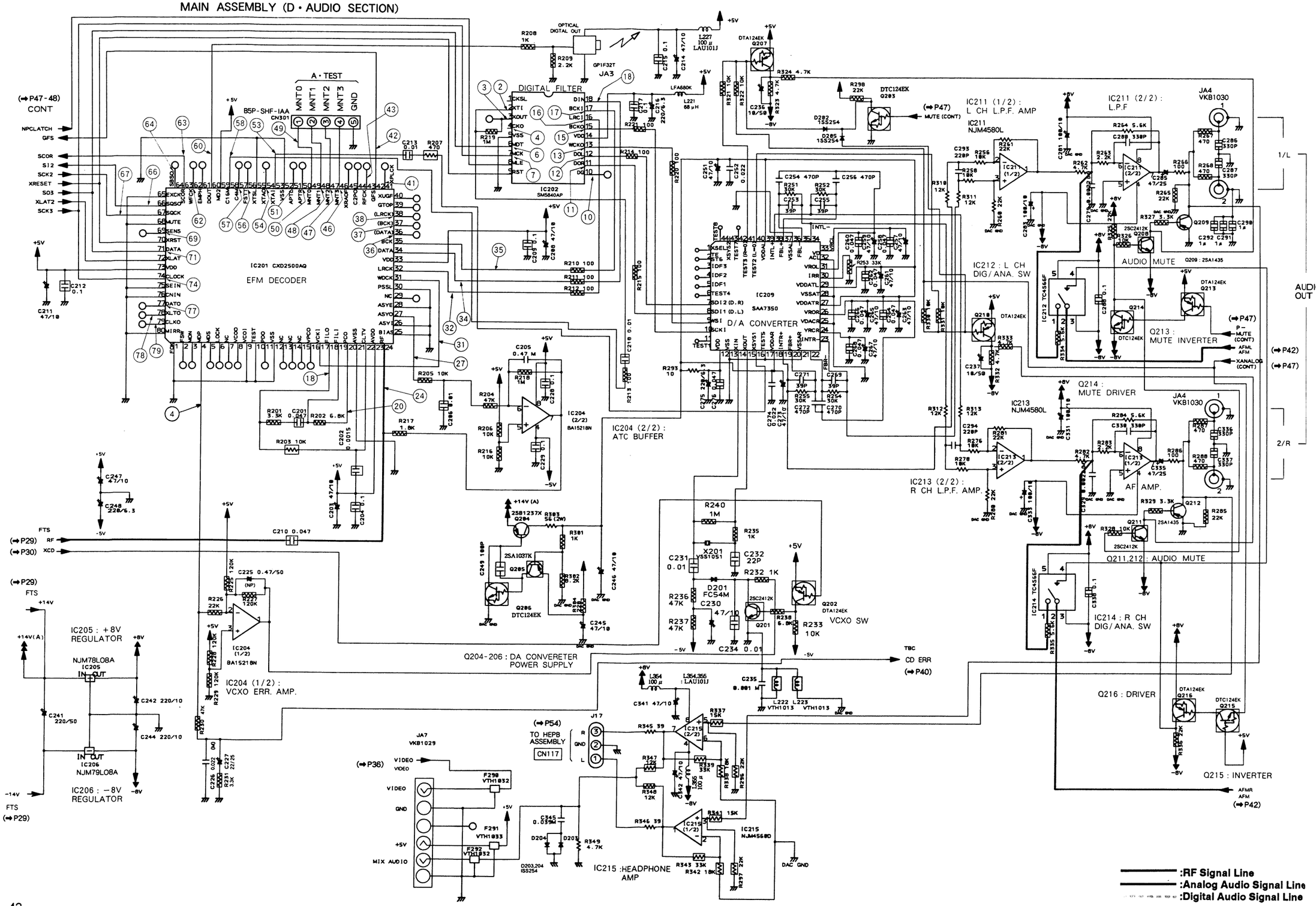
Note: Waveforms and voltages are at the PLAY state.
IC351 (PA0034A)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	– 5V	15	*	29	*
2	*	16	*	30	*
3	*	17	*	31	*
4	—	18	*	32	*
5	—	19	*	33	*
6	*	20	0	34	*
7	*	21	*	35	*
8	*	22	*	36	*
9	*	23	*	37	—
10	*	24	0	38	—
11	*	25	5V	39	—
12	*	26	0	40	—
13	*	27	0	41	*
14	*	28	*	42	– 5V

*: Refer to Waveforms

5.9 MAIN ASSEMBLY (D. AUDIO SECTION)

MAIN ASSEMBLY (D • AUDIO SECTION)



Note: Wavefor ms and voltages are at the PLAY

IC201 (CXD2500AQ)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	0	15	0	29	0	43	*	57	*	71	*
2	0	16	4.8	30	0	44	0	58	*	72	5
3	0	17	0	31	*	45	4.8	59	5	73	5
4	*	18	*	32	*	46	*	60	*	74	*
5	0	19	2.4	33	4.8	47	*	61	5	75	0
6	4.8	20	*	34	*	48	*	62	*	76	0
7	0	21	0	35	*	49	*	63	*	77	*
8	4.8	22	2.3	36	*	50	*	64	*	78	*
9	0	23	4.8	37	*	51	*	65	0	79	*
10	0	24	*	38	*	52	0	66	*	80	0
11	0	25	0	39	0	53	*	67	*		
12	0	26	0	40	4.8	54	*	68	0		
13	0	27	*	41	*	55	0	69	*		
14	0	28	0	42	*	56	*	70	5		

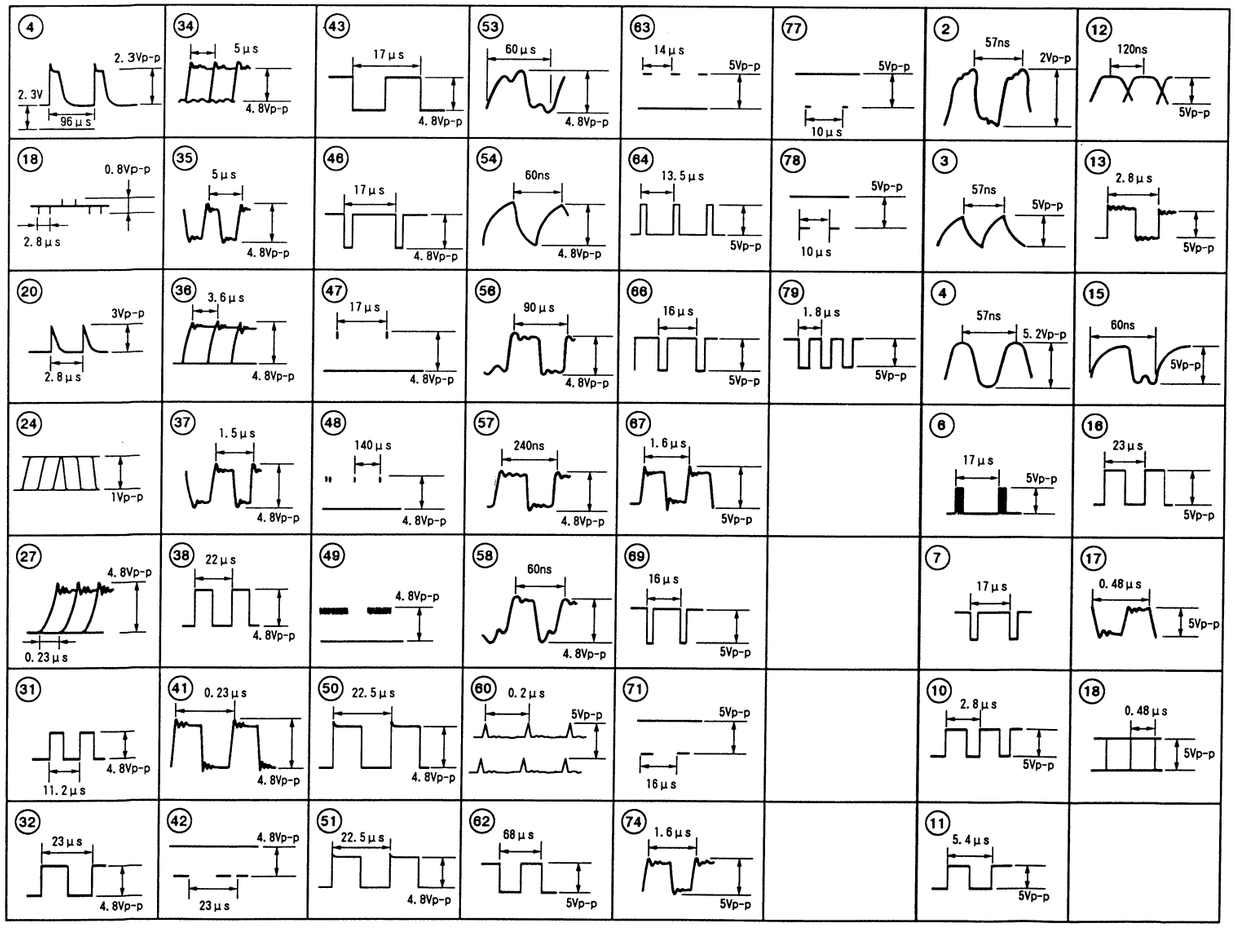
*: Refer to Waveforms

IC202 (SM5840AP)

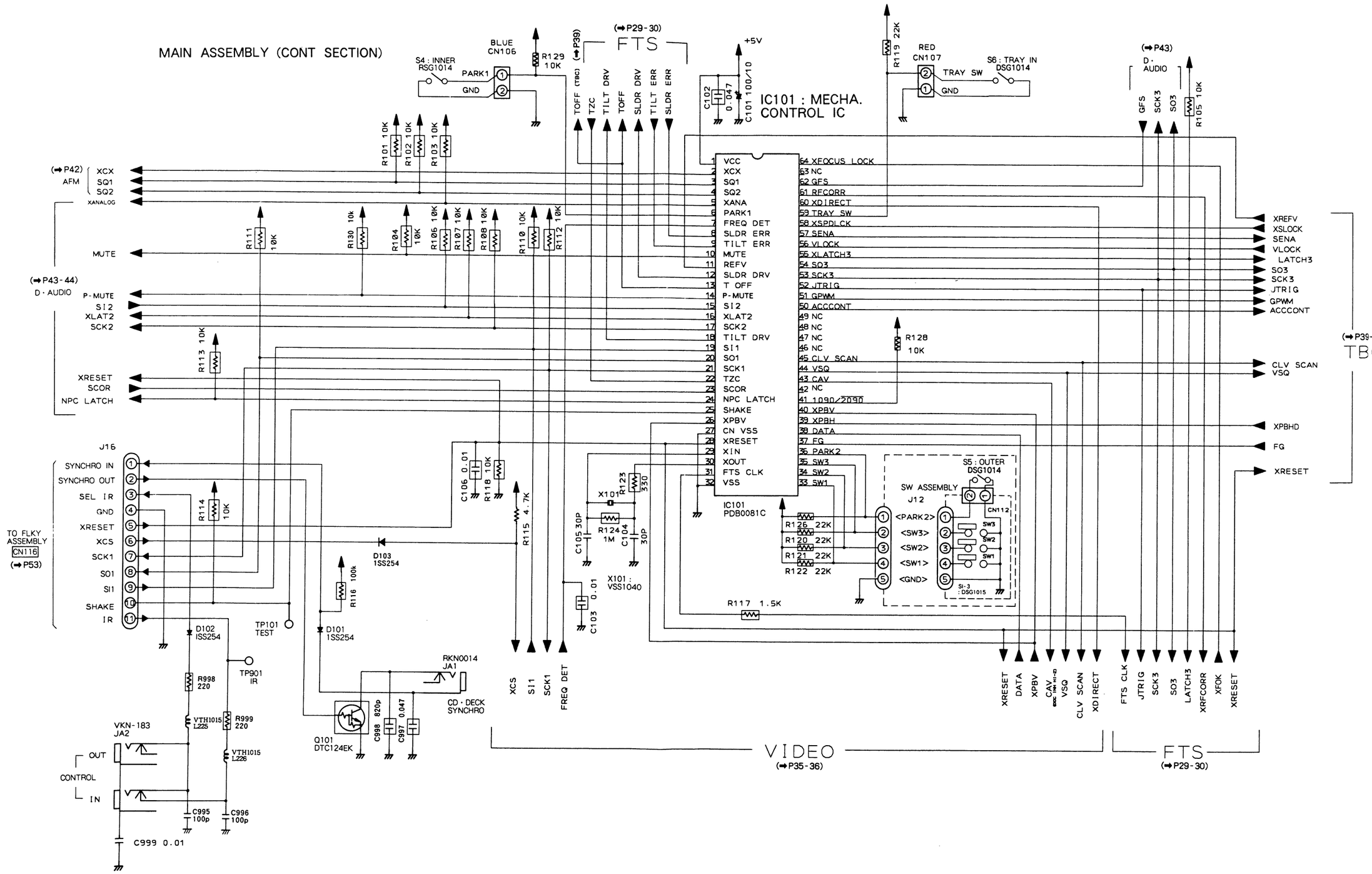
Pin No.	Voltage	Pin No.	Voltage
1	5	10	*
2	*	11	*
3	*	12	*
4	*	13	*
5	0	14	5
6	*	15	*
7	*	16	*
8	5	17	*
9	5	18	*

IC201 (CXD2500AQ)

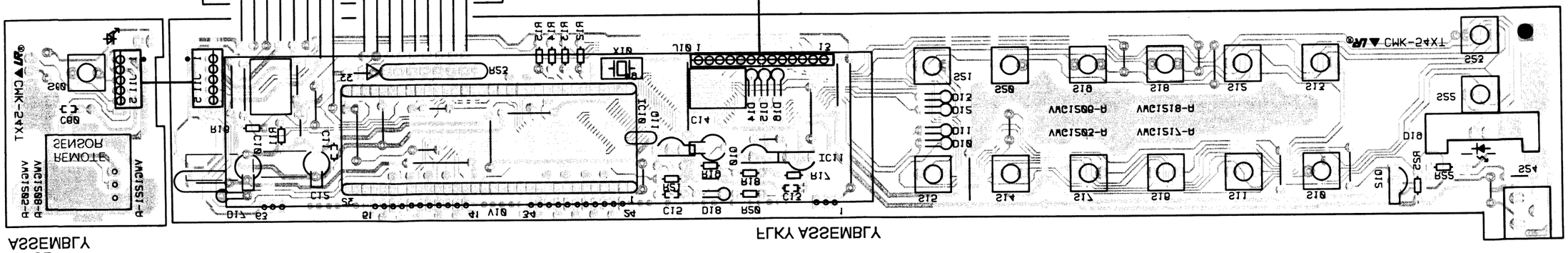
IC202 (SM5840AP)

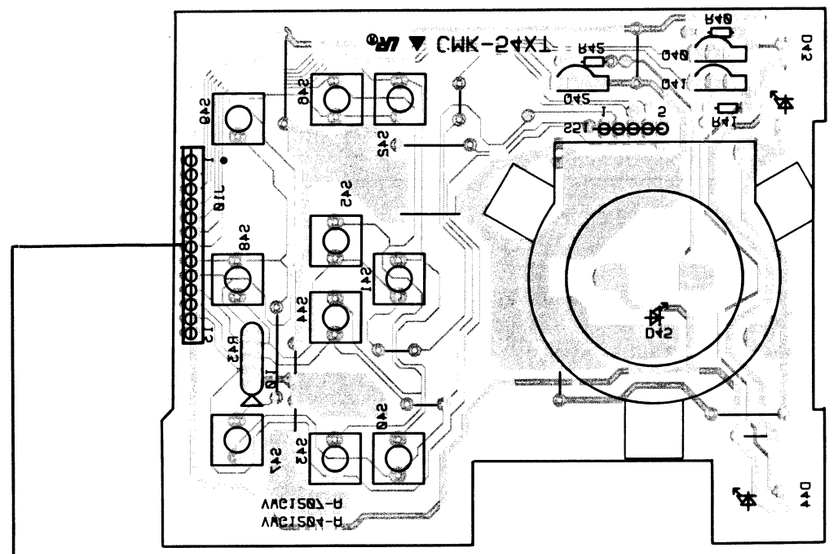


5.10 MAIN ASSEMBLY (CONT SECTION)



P.C.B. LEVEL, PWSB AND SHKY ASSEMBLIES





This P.C.B. connection diagram is viewed from the foil side.

5.11 FLKY, PWS B AND SHKY ASSEMBLIES

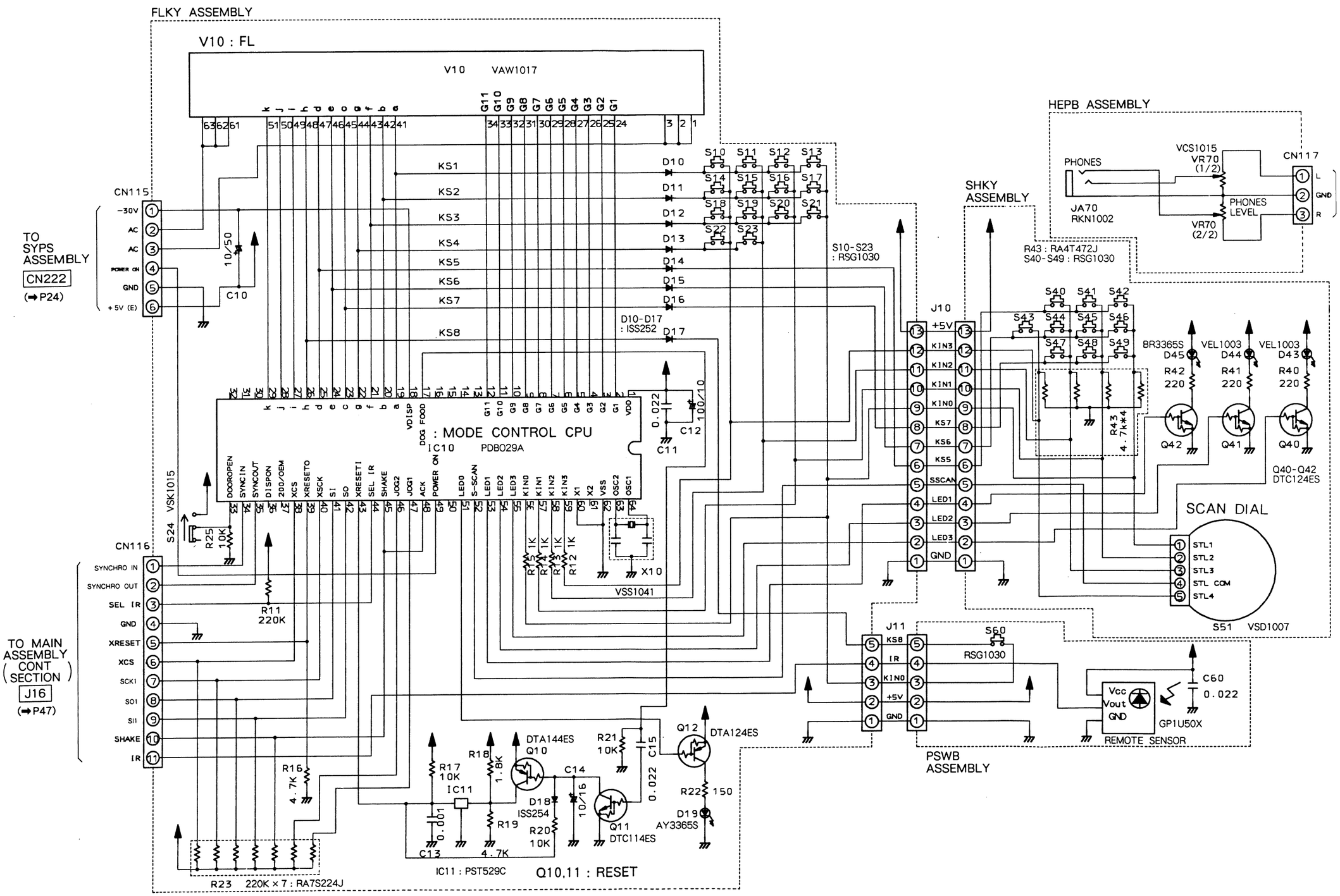
PWSB ASSEMBLY

FLKY ASSEMBLY

SHKY ASSEMBLY

SYPS ASSEMBLY CN222

MAIN ASSEMBLY J16


FLKY ASSEMBLY
V10 : FL
V10 VAW1017
CN115
-30V
AC
AC
POWER ON
GND
+5V (E)
TO SYPS ASSEMBLY
CN222
(➡P24)
10/50
C10
KS1
KS2
KS3
KS4
KS5
KS6
KS7
KS8
D10
D11
D12
D13
D14
D15
D16
D17
D10-D17 : ISS252
S10 S11 S12 S13
S14 S15 S16 S17
S18 S19 S20 S21
S22 S23
S10-S23 : RSG1030
: MODE CONTROL CPU
IC10 PDB029A
VDISP
DOG FOOD
VDD
0.022
C12
100/10
C11
DOOROPEN
SYNC IN
SYNCOUT
DISPON
200/OEM
XCS
XRESETO
XSCK
SI
SO
XRESETI
SEL IR
SHAKE
JOG2
JOG1
ACK
POWER ON
LED0
S-SCAN
LED1
LED2
LED3
KIN0
KIN1
KIN2
KIN3
X1
X2
VSS
OSC2
OSC1
S24 VSK1015
R25 10K
R11 220K
R13 1K
R14 1K
R15 1K
R12 1K
X10
VSS1041
CN116
SYNCHRO IN
SYNCHRO OUT
SEL IR
GND
XRESET
XCS
SCKI
SOI
SII
SHAKE
IR
TO MAIN ASSEMBLY (CONT SECTION)
J16
(➡P47)
R16 4.7K
R17 10K
R18 1.8K
IC11
C13 0.001
R19 4.7K
DTA144ES Q10
C14 10/16
D18 ISS254
R20 10K
Q11 DTC114ES
R21 10K
C15 0.022
Q12 DTA124ES
R22 150
D19 AY3365S
R23 220K × 7 : RA7S224J
IC11 : PST529C
Q10,11 : RESET
J10
+5V
KIN3
KIN2
KIN1
KIN0
KS7
KS6
KS5
SSCAN
LED1
LED2
LED3
GND
SHKY ASSEMBLY
HEPB ASSEMBLY
PHONES
JA70 RKN1002
VCS1015
VR70 (1/2)
PHONES LEVEL
VR70 (2/2)
CN117
L
GND
R
TO MAIN ASSEMBLY (D・AUDIO SECTION)
J17
(➡P43)
R43 : RA4T472J
S40-S49 : RSG1030
S40 S41 S42
S43 S44 S45 S46
S47 S48 S49
R43 4.7k*4
BR3365S D45
VEL1003 D44
VEL1003 D43
R42 220
R41 220
R40 220
Q42
Q41
Q40
Q40-Q42 DTC124ES
SCAN DIAL
STL1
STL2
STL3
STL COM
STL4
S51 VSD1007
J11
KS8
IR
KIN0
+5V
GND
S60
RSG1030
Vcc
Vout
GND
GP1U50X
REMOTE SENSOR
C60 0.022
PSWB ASSEMBLY

6. ELECTRICAL PARTS LIST

NOTES:

- *Parts without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits(any digit apart from 0), such as 560 ohm and 47k ohm(tolerance is shown by J=5%, and K=10%).

560 Ω→56 × 10¹ →561 ····· RD1/4PS 5 6 1 J
47k Ω→47 × 10³ →473 ····· RD1/4PS 4 7 3 J
0.5 Ω→0R5 ····· RN2H 0 R 5 K
1 Ω→010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits(such as in high precision metal film resistors).

5.62k Ω→562 × 10¹ →5621 ····· RN1/4SR 5 6 2 1 F

Miscellaneous Parts

Mark	Symbol & Description	Part No.
◉	MOTHER assembly ├MAIN assembly ├FG assembly └SW assembly	VWM1159
◉	SYPS assembly	VWR1090
◉	FLKB assembly ├FLKY assembly ├SHKY assembly ├PSWB assembly └HEPB assembly	VWM1160
⚠	FU201,202 Fuse (3A)	VEK-018
⚠	FU203,204 Fuse (1A)	REK-080
⚠	Power transformer	VTT1079
⚠	Strain relief	CM-22C
⚠	AC power cord	PDG1015
	S4,S5 Push switch (INNER, OUTER)	DSG1014
	S6 Push switch (TRAY IN)	DSG1014
	Carriage motor assembly	VXX1261
	Loading motor assembly	VXX1262
	Spindle motor assembly	VXA1474
	Pre-pickup assembly	VXX1413
	Servo mechanism base assembly-S	VXX1583

◉ MOTHER Assembly(VWM1159)

MOTHER assembly is composed of the MAIN, FG and SW assemblies.

MAIN Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC204,IC802	BA15218N
	IC801	CXA1081S
	IC201	CXD2500AQ
	IC403	CXL1009P
	IC804	LA6510
	IC602,IC603	NJM4558S
	IC215	NJM4560D
	IC211,IC213	NJM4580L
	IC205	NJM78L08A
	IC208	NJM78M05FA
	IC206	NJM79L08A
	IC404	PA0017
	IC351	PA0034A
	IC401	PA5013A
	IC405	PD0070
	IC101	PD0081C
	IC402	PM0001
	IC601	PM3002
	IC803	PM3003
	IC209	SAA7350
	IC202	SM5840AP
	IC406	TA7302P
	IC212,IC214	TC4S66F-TR
	Q202,Q207,Q210,Q213,Q216,Q403, Q613,Q820,Q824,Q826,Q829,Q830	DTA124EK
	Q101,Q203,Q206,Q214,Q215,Q606, Q608,Q811,Q823,Q827,Q828	DTC124EK
	Q601	FMW2-TR
	Q205,Q457,Q496,Q511,Q554,Q581, Q609,Q806,Q808,Q812,Q819,Q832	2SA1037K
	Q209,Q212	2SA1435
	Q552,Q556,Q603,Q605	2SA933S
	Q816,Q818	2SB1185
	Q204,Q401	2SB1237X
	Q352,Q431,Q551,Q553,Q557, Q582,Q583,Q602,Q604	2SC1740S
	Q201,Q208,Q211,Q432,Q456, Q497-Q500,Q541,Q558,Q607, Q610,Q612,Q801-Q805,Q807, Q809,Q810,Q814,Q825,Q833	2SC2412K
	Q351	2SC2786
	Q815,Q817	2SD1762
	Q402,Q822	2SD1858X
	Q821	2SK184
	D201	FC54M
	D101-D103,D202-D205, D601-D604,D607-D611,D801, D804-D808	1SS254

COILS AND FILTERS

Mark	Symbol & Description	Part No.
	L227,L354,L355,L601,L602	LAU101J
	L414,L415,L521,L551	LAU120J
	L801,L803	LAU151J
	L496,L553	LAU180J
	L497,L802	LAU181J
	L412,L413,L523	LAU220J
	L353,L441	LAU270J
	L411,L416	LAU330J
	L433	LAU390J
	L431	LAU430J
	L541,L552,L603	LAU470J
	L351,L352,L522	LAU560J
	L432	LAU620J
	L511	LAU820J
	L457,L458	LFA221J
	L456	LFA471J
	L524	LFA561K
	L221	LFA680K
	L222,L223 Ferrite beads	VTH1013
	L225,L226	VTH1015
	F401 Comb filter	VTF1042
	F351 BPF (2.30,02.81MHz)	VTF1047
	F290,F292	VTH1032
	F291	VTH1033

CAPACITORS

Mark	Symbol & Description	Part No.
	VC901 Ceramic trimmer (20P)	VCM-008
	C995,C996	CCCCH101J50
	C104,C105	CCCCH300J50
	C253,C255,C269,C271	CCCCH390J50
	C837,C871	CCCSL331J50
	C293,C294	CKPUYB221K50
	C254,C256,C270,C272	CCCSL471J50
	C441	CCSQCH070J50
	C817	CCSQCH050C50
	C438,C450,C497,C500,C546,C895	CCSQCH100D50
	C249,C456,C461,C528,C554,C563, C586,C603,C658,C810,C811,C822	CCSQCH101J50
	C417,C545	CCSQCH120J50
	C557	CCSQCH150J50
	C413,C509	CCSQCH151J50
	C423,C424,C624-C627,C629, C655,C659	CCSQCH180J50
	C553	CCSQCH181J50
	C232,C485,C516,C806	CCSQCH220J50
	C352,C414	CCSQCH221J50
	C415,C437,C451,C510,C812,C815	CCSQCH270J50
	C380,C463	CCSQCH271J50
	C447,C462	CCSQCH330J50
	C416,C433,C440,C496,C524,C804	CCSQCH390J50
	C412,C419,C420,C439,C890,C891, C893	CCSQCH470J50
	C374,C381	CCSQCH560J50
	C809,C813	CCSQCH680J50
	C498,C654	CCSQCH820J50
	C351,C353,C529,C536	CCSQCH910J50
	C286,C287,C336,C337,C362	CCSQSL331J50
	C411,C818	CCSQSL471J50
	C819	CCSQSL561J50
	C401	CEAL2R2M50
	C225,C866	CEANPR47M50
	C807,C838	CEANP010M50
	C530,C842,C845,C863	CEANP100M16
	C616,C850	CEANP2R2M50
	C368,C386,C618	CEANP220M10
	C870	CEANP470M10
	C388	CEASR47M50
	C436,C471,C556,C808,C814, C816,C823,C840	CEAS010M50
	C236,C237,C355,C370,C522,C855, C864,C902	CEAS100M50
	C101,C281,C283,C331,C333,C360, C361,C378,C379,C434,C445,C457, C489,C490,551	CEAS101M10
	C227,C364,C383,C612,C835,C836, C841,C876,C877	CEAS220M25
	C242,C244	CEAS221M10
	C241	CEAS221M50
	C216,C248,C275,C376,C582,C601, C857,C859	CEAS221M5R3
	C472,C475,C476	CEAS3R3M50
	C443,C621	CEAS4R7M50
	C208,C214,C230,C245-C247,C251, C257,C259,C261,C263,C265,C267, C273,C275,C341,C342,C369,C428, C452,C464,C465,C499,C501,C502, C512,C521,C525,C533,C542,C622, C641,C642,C896,C897	CEAS470M10

Mark	Symbol & Description	Part No.
	C285,C335,C484	CEAS470M25
	C583	CEAS471M6R3
	C446,C614,C650,C824,C849,C861, C865,C873	CFTNA103J50
	C372,C373,C514,C615,C832,C838, C874,C878,C880	CFTNA104J50
	C842,C845	CEJANP100M16
	C807	CFTNA124J50
	C226,C617,C843	CFTNA223J50
	C474,C604,C852,C900	CFTNA224J50
	C827,C867	CFTNA333J50
	C345,C367,C387	CFTNA393J50
	C203,C211	CEJA470M10
	C848,C869	CFTNA473J50
	C205	CFTNA474J50
	C610	CFTNA563J50
	C515,C517,C847,C868	CFTNA683J50
	C999	CKCYF103Z50
	C830	CFTNA154J50
	C252,C274	CKPUYF223Z25
	C280,C330	CKPUYB331K50
	C202	CKSQYB152K50
	C365,C366,C384,C385	CKSQYB472K50
	C875,C879	CKSQYB562K50
	C363,C382	CKSQYB682K50
	C883	CFTNA823J50
	C854,C998	CKSQYB821K50
	C103,C106,C206,C213,C218,C231, C234,C354,C359,C377,C418,C425, C426,C458-C460,C486,C535,C558, C559,C562,C628,C643-C646, C651-C653,C801-C803,C828,C829, C856,C901	CKSQYF103Z50
	C204,C209,C212,C215,C217,C228, C229,C288,C338,C403,C404, C427,C429,C435,C442,C479,C480, C503,C505,C506,C511,C513,C526, C531,C541,C543,C552,C560,C561, C564,C584,C585,C851,C858,C860, C881,C882	CKSQYF104Z25
	C102,C201,C210,C258,C260,C262, C264,C266,C268,C276,C407,C408, C431,C432,C448,C449,C466,C467, C473,C477,C478,C483,C487,C488, C504,C507,C527,C534,C544,C547, C548,C555,C567,C581,C602,C623, C805,C820,C997	CKSQYF473Z25
	C290-C292,C537	CKSYF105Z16
	C235,C605,C607,C839	CQMA102J50
	C608,C834	CQMA152J50
	C279,C329,C620	CQMA222J50
	C444,C611,C656,C657,C899	CQMA272J50
	C613,C619,C853	CQMA332J50
	C898	CQMA472J50
	C825	CQMA682J50
	C606	CQPA821J100

RESISTORS

Mark	Symbol & Description	Part No.
	VR601 Semi-fixed (1k Ω)	VRTB6VS102
	VR441,VR482,VR602,VR603 Semi-fixed (10k Ω)	VRTB6VS103
	VR607 Semi-fixed (22k Ω)	VRTB6VS223
	VR605,VR606 Semi-fixed (2.2k Ω)	VRTB6VS222
	VR608 Semi-fixed (33k Ω)	VRTB6VS333
	VR481,VR604,VR609 Semi-fixed (4.7k Ω)	VRTB6VS472
	VR521 Semi-fixed (4.7k Ω)	VRTG6VS472
	R303	RS2LMF300J
	R415,R416,R434,R438,R511, R680 – R683	RN1/6PQ□□□□J
	R115,R251,R252,R254-R256,R258, R260-R264,R266,R276,R278, R280-R284,R286,R293,R310-R313, R340,R344-R346,R349,R357,R403, R431,R442,R456,R552-R554,R556, R557,R563,R564,R568,R585-R588, R603,R618,R629,R647,R665-R678, R691,R709,R849,R850,R862,R869, R873,R904,R910-R913,R918, R923,R934,R942	RD1/6PM□□□J
	Other resistors	RS1/10S□□□J

OTHERS

Mark	Symbol & Description	Part No.
	X601 Crystal resonator (14.318MHz)	VSS1026
	X101 Ceramic resonator (9.00MHz)	VSS1040
	X201 Crystal resonator (16MHz)	VSS1051
	CN301 5P top post	B5P-SHF-1AA
	CN103 23P top connector	VKN1073
	JA3 Optical digital module (DIGITAL OUT, OPTICAL)	GP1F32T
	JA1 Mini jack (CD-DECK SYNCHRO)	RKN1014
	JA7 RF pin jack (VHF ADAPTER OUTPUT)	VKB1029
	JA4 6P pin jack AUDIO, VIDEO OUT)	VKB1030
	JA2 2P pin jack (CONTROL)	VKN-183
	4P mini DIN socket (S VIDEO OUT)	VKN1072

FG Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	Photo interrupter	GP1S51

SW Assembly

SWITCHES

Mark	Symbol & Description	Part No.
	S1-S3 Push switch (LOADING/TILT)	DSG1015

◉ FLKB Assembly (VWM1160)

FLKB assembly is composed of the FLKY, SHKY, PSWB and HEPB assemblies.

FLKY Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC10	PDB029A
	IC11	PST529C
	Q12	DTA124ES
	Q10	DTA144ES
	Q11	DTC114ES
	D19	AY3365S
	D10-D17	1SS252
	D18	1SS254

SWITCHES

Mark	Symbol & Description	Part No.
	S10-S23 Tact switch (PGM,DIRECT SEARCH (0-9,+10), DERECT CD,SINGLE)	RSG1030
	S24 Door switch	VSK1015

CAPACITORS

Mark	Symbol & Description	Part No.
	C10	CEAS100M50
	C12	CEAS101M10
	C14	CEJA100M16
	C13	CKPUYB102K50
	C11,C15	CKPUYF223Z25

RESISTORS

Mark	Symbol & Description	Part No.
	R23 Resistor array	RA7S224J
	Other resistors	RD1/6PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	V10 Fluorescent indicator tube	VAW1017
	X10 Ceramic resonator (6.00MHz)	VSS1041
	FL spacer	VEB1125

SHKY Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	Q40-Q42	DTC124ES
	D45	BR3365S
	D43,D44	VEL1003

SWITCHES

Mark	Symbol & Description	Part No.
	S40-S49 Tact switch (DIGITAL LEVEL CTRL,PGM EDIT, PEAK SEARCH,RANDOM PLAY, HILITE INTRO SCAN,SKIP(|◀◀, ▶▶|), OPEN/CLOSE(▲), STOP(■), PLAY/PAUSE(▶/II))	RSG1030
	S51 Rotary encoder	VSD1007

RESISTORS

Mark	Symbol & Description	Part No.
	R43 Resistor array	RA4T472J
	R40-R42	RD1/6PM221J

PSWB Assembly

SWITCH

Mark	Symbol & Description	Part No.
	S60 Tact switch (POWER)	RSG1030

CAPACITOR

Mark	Symbol & Description	Part No.
	C60	CKPUYF223Z25

OTHERS

Mark	Symbol & Description	Part No.
	Remote control sensor unit	GP1U50X

HEPB Assembly

RESISTOR

Mark	Symbol & Description	Part No.
	VR70 Double rotary volume (LEVEL)	VCS1015

OTHER

Mark	Symbol & Description	Part No.
	JA70 Headphone jack	RKN1002

◉ SYPS Assembly (VWR1090)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
⚠	IC201	ICP-N15
	IC202	ICP-N15
	IC206	ICP-N25
⚠	IC205	NJM78M05FA
	Q217	DTA114ES
	Q213	DTC114ES
	Q214,Q219	2SA933S
	Q202,Q203,Q205	2SB1185
⚠	Q207	2SB1238X
	Q218	2SC1740S
	Q201,Q204,Q206	2SD1762
	D220	MTZJ22C
	D102,D104	MTZJ5.1C
	D101,D103	MTZJ5.6B
⚠	D201,D202	S2VB20-F
⚠	D213,D214	1SR35-100AVL
	D222,D223	1SR35-100AVL
⚠	D208,D209	1SS252
⚠	D216,D217	1SS252
	D212,D215	10ELS2

COILS

Mark	Symbol & Description	Part No.
⚠	L202 Line filter	VTL-262
⚠	L201 Coil (10mH)	VTL1008

CAPACITORS

Mark	Symbol & Description	Part No.
	C205,C206 Aluminum (3300/25V)	VCH1095
⚠	C216 Ceramic(10000p/AC400V)	RCG-009
	C217 Ceramic(10000p/AC400V)	RCG-009
	C209,C210,C226,C231,C232, C242,C245	CEAS101M10
	C213	CEAS471M35
	C223	CEAS101M25
	C219	CEAS101M35
	C235	CEAS102M25
	C214,C215	CEAS2R2M50
	C240,C243	CEAS221M10
	C208	CEAS472M10
	C207	CEAS682M10
	C212,C237,C238	CGCYX473M25
	C196-C199,C246	CKCYF103Z50
	C241,C244	CKPUYB102K50
	C201-C204	CKPUYF103Z25

RESISTORS

Mark	Symbol & Description	Part No.
⚠	R221	RS1LMFR51J
	R239	RS1LMF4R7J
	R241	RD1/2PM225J
	Other resistors	RD1/6PM□□□J

HEAD Assembly

CAPACITORS

Mark	Symbol & Description	Part No.
	C1	CKSQYF473Z50
	C5	CKSYF105Z16

RESISTOR

Mark	Symbol & Description	Part No.
	VR1 Chip semi-fixed	VCP1040

7. DISASSEMBLY

7.1 REMOVING THE BONNET AND FRONT PANEL (Fig. 7-1, 2)

① Remove six screws Ⓐ to remove the bonnet.
② To remove the front panel assembly, remove three screws Ⓑ and lift the claws as shown in the figure and lower the front panel toward the front.

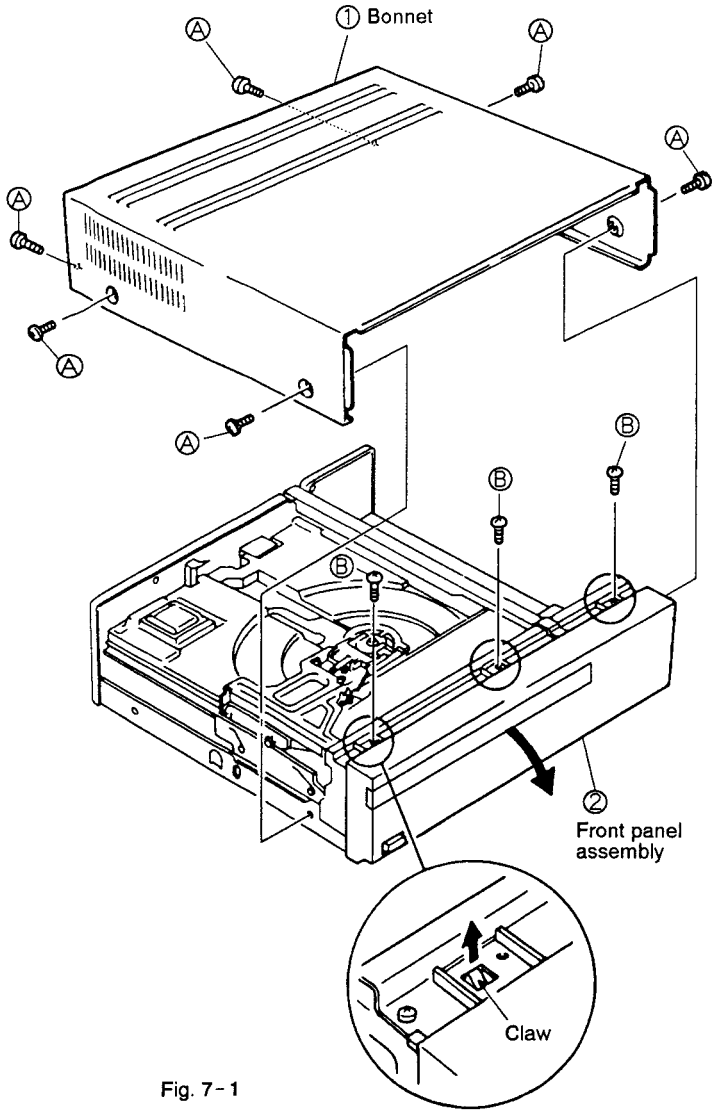


Fig. 7-1

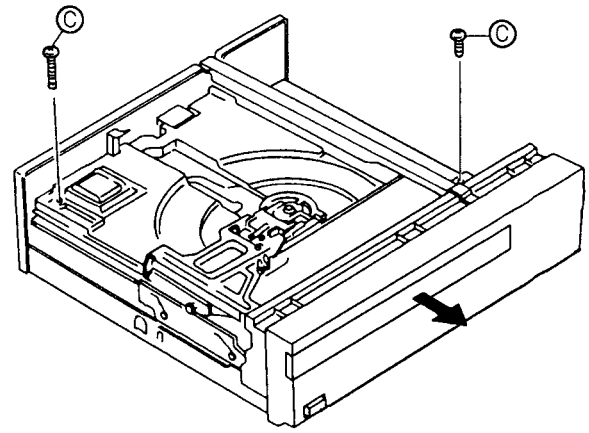


Fig. 7-2

7.2 REMOVING THE TRAY(Fig. 7-2, 3)

① Remove two stopper screws Ⓒ shown in Fig. 7-2. When the power can be turned ON, press the OPEN (▲) button then pull the tray out from the player.
② When the power cannot be turned ON, remove the front panel (Fig. 7-1), and turn the gear pulley shown in Fig. 7-3 counterclockwise, and the tray will slide out toward the front.

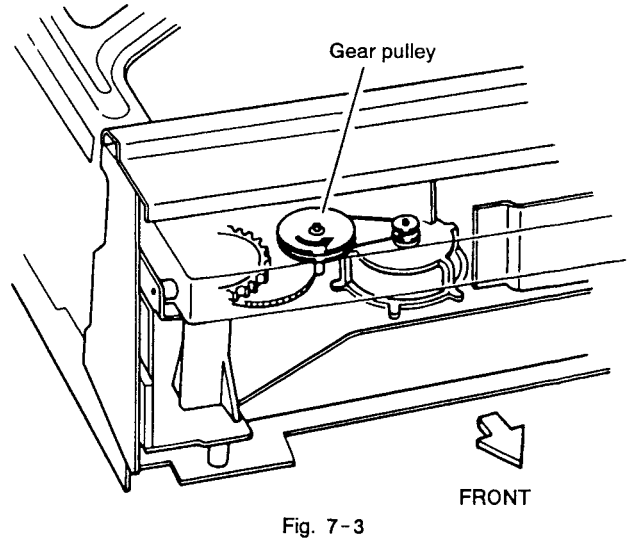


Fig. 7-3

7.3 REMOVING THE MAIN ASSEMBLY (Fig. 7-4)

- After removing the main binders, remove by the following procedure:

① Remove two screws Ⓐ to remove the center angle.
② Remove two screws Ⓑ holding the MAIN assembly, and remove seven screws Ⓒ on the sides of the rear panel.
③ Remove the flexible cable from the connector.
④ Pull the MAIN assembly in the direction of the arrow.
⑤ While sliding the MAIN assembly to the right, lift it upward in the direction of the arrow.

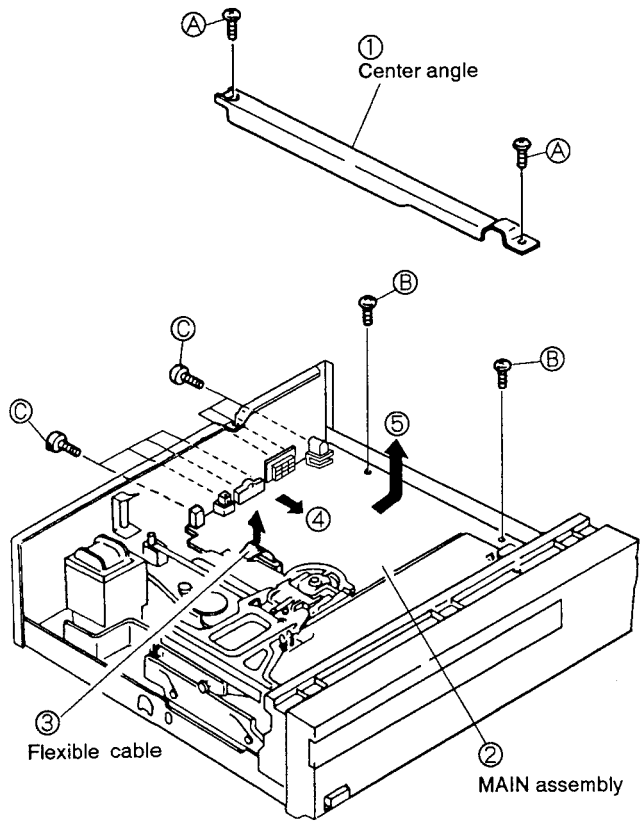


Fig. 7-4

● Diagnosis of the MAIN assembly

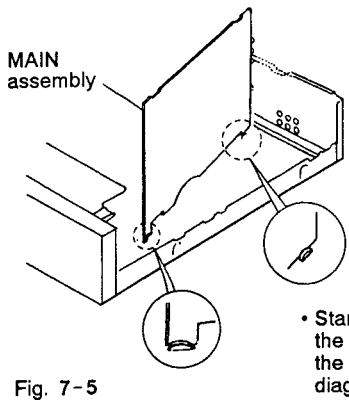


Fig. 7-5

- Stand the MAIN assembly in the chassis as illustrated, and the MAIN assembly is able to diagnose from the foil side.

7.4 REMOVING THE CLAMPER ARM (B) AND CLAMPER ARM (A) ASSEMBLY (Fig. 7-6)

Set the player with the tray moved up.

① Remove two clamper springs and raise clamper arm (B).
② Clamper arm (B) can be removed by pulling it in the direction of the arrow.
③ Remove a screw Ⓐ with a arm spring holding the clamper arm (A) assembly.
④ Remove the clamper arm (A) assembly by pulling it in the direction of the arrow.

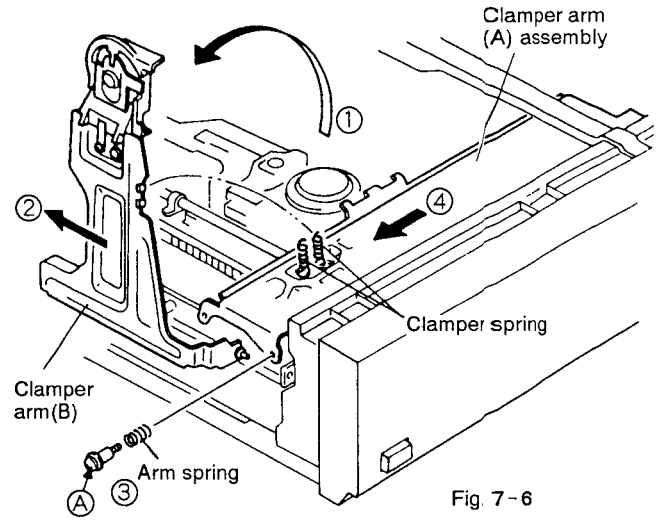


Fig. 7-6

7.5 REMOVING THE CLAMPER (Fig. 7-7)

① Remove the plate spring by unscrewing screw Ⓐ.
② Remove the parallel link by sliding it in the direction of the arrow. (Be careful not to damage the claw located on one side of the link.)
③ The clamper can be removed by sliding the clamper holder in the direction of the arrow.

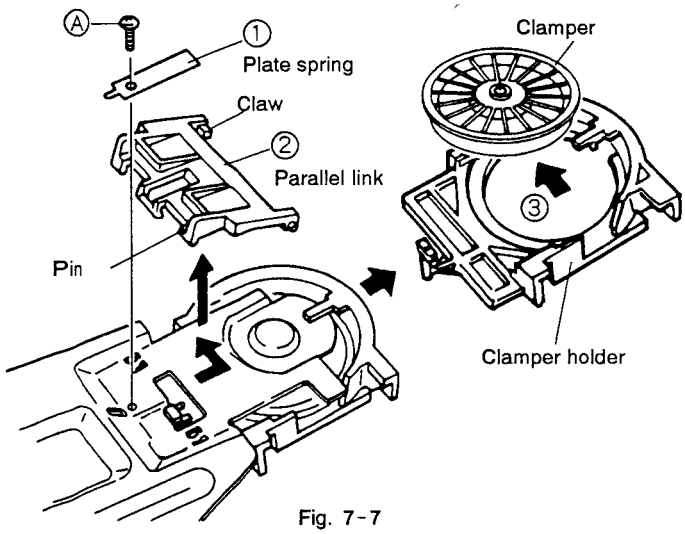


Fig. 7-7

7.6 REMOVING THE PICKUP ASSEMBLY (Fig. 7-8)

① Remove the flexible cable from the connector and also remove the flexible cable installed at section ⓐ.
② Remove a screw Ⓐ holding the carriage shaft.
③ Raise the shaft in the direction of the arrow to remove the rack assembly.
④ Remove a hexagonal screw Ⓑ and lift up the pickup assembly alightly and turn the pickup assembly in the direction of arrow ⑤.
⑤ Remove two screws Ⓒ on the back of the pickup assembly.

Note: Make sure that the rack assembly is not close to the turntable when it is removed.

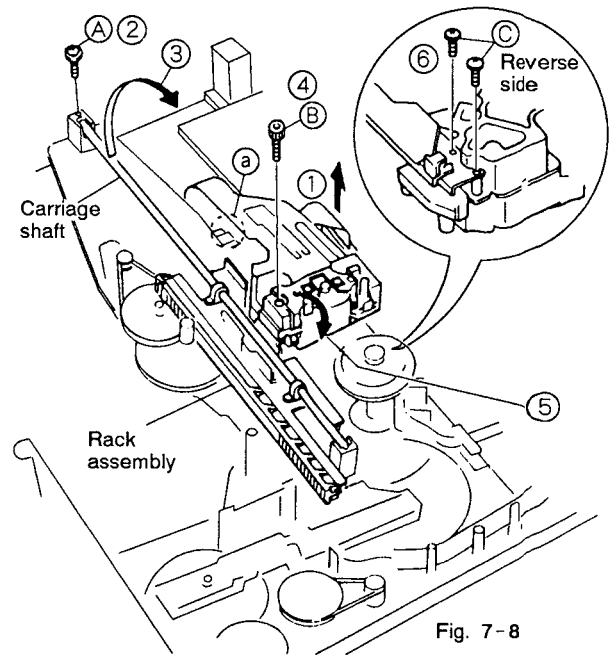


Fig. 7-8

7.7 REMOVING THE TILT SENSOR (Fig. 7-9)

① Remove the connector (arrow Ⓐ) of the flexible cable and release the claw (arrow Ⓑ) to remove the tilt sensor.

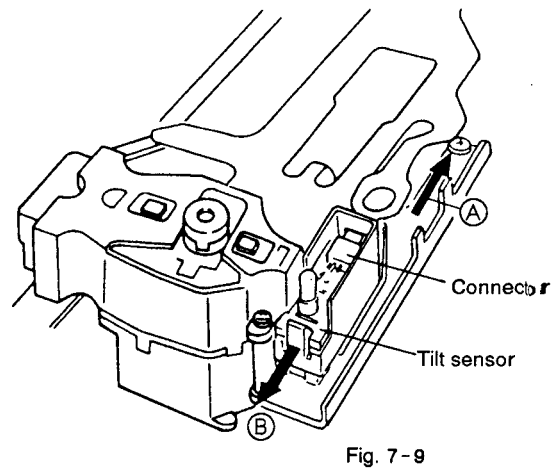


Fig. 7-9

7.8 REMOVING THE MECHANISM SECTION (Fig. 7-10)

Remove six screws Ⓐ, and the entire mechanism section can be removed.

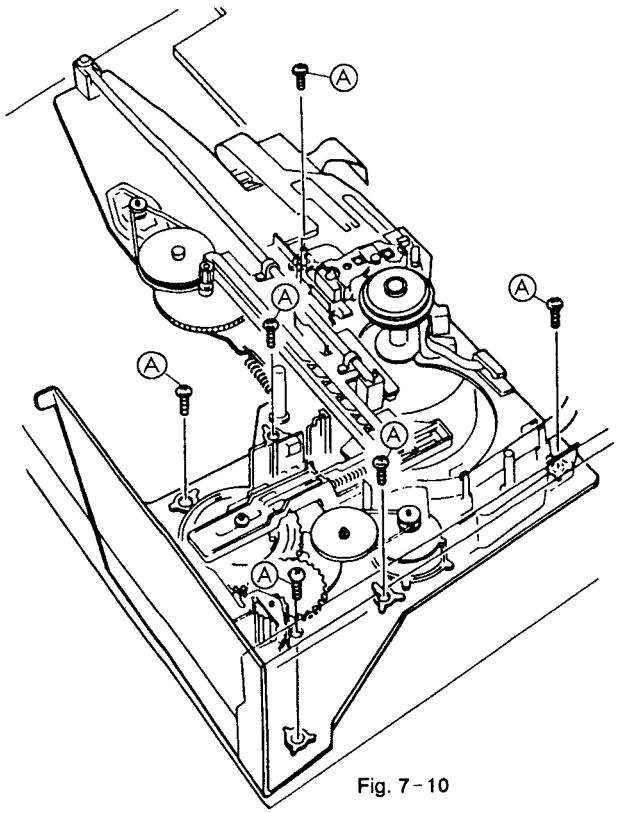


Fig. 7-10

7.9 REMOVING THE SLIDE CAM AND ROLLER PLATE ASSEMBLY(Fig. 7-11)

① Set the player with the tray down.
② Remove three screws Ⓐ and slide the slide cam toward the rear to remove it.
③ Remove the clamper arm (A) assembly (see page 61) after removing slide cam to remove the roller plate assembly.

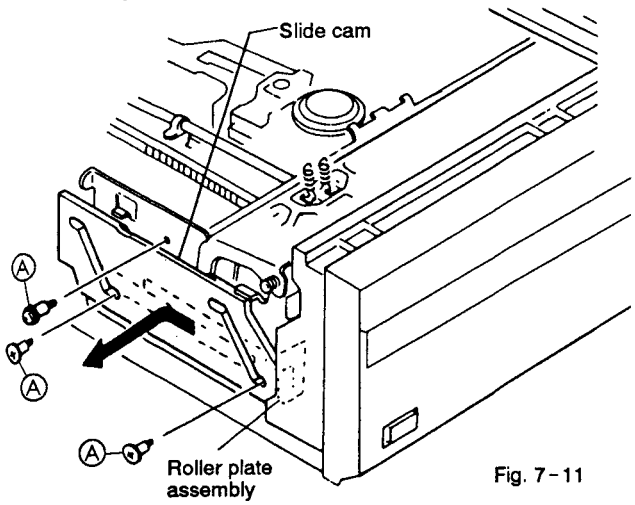


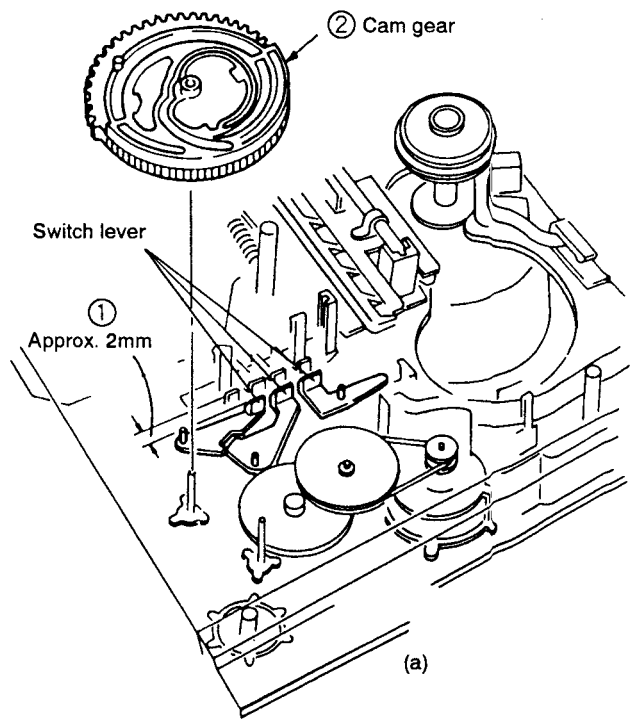
Fig. 7-11

7.10 ASSEMBLING THE MECHANISM SECTION

7.10.1. Positioning the gears

(Since the cam gears are used for the detection of all operation modes in this unit, the cam gears and the tray should be positioned correctly. Reassemble in the following procedure.)

① Position three switch levers so that they are nearly parallel (approx. 2mm), as shown in Fig. 7-12 (a).
② Insert the cam gear so that the end of the spiral groove on the upper surface of the cam gear comes to the position nearest to the shaft located at the front, as shown in Fig. 7-12 (b).
(In this case, the cam gear should be set in the position where the angle between the center line of the cam gear and the pin on the cam gear is 45°, by visual checking.)



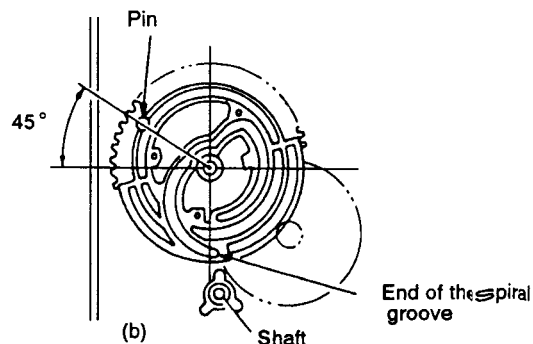


Fig. 7-12

③ Mount the spring slanting cam by raising the rack assembly in the direction of the arrow so that the tilt slide section comes under the rack assembly.Then, mount the cam spring. (Fig. 7-13 (a))

④ Insert the follow gear so that the "L"-shaped section of the follow gear comes to the end of the cam gear, as shown in Fig. 7-13 (b).

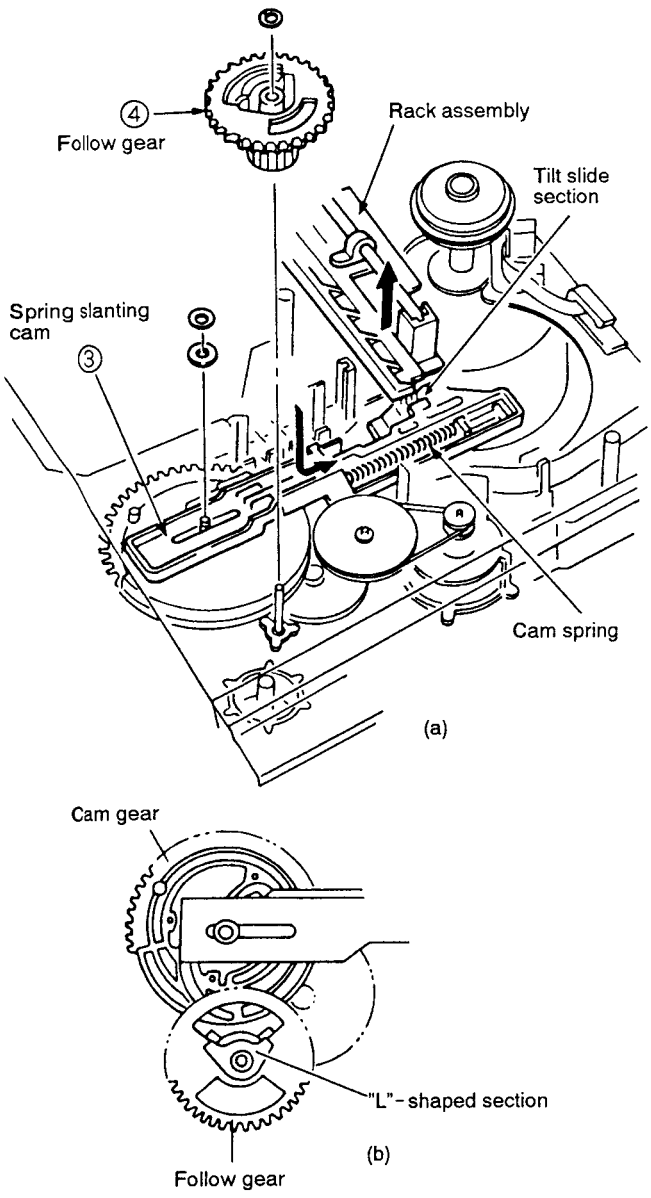


Fig. 7-13

⑤ Mount the roller plate assembly in the position where the tooth with the triangle mark (▼) of the follow gear is engaged with the dip of the gear with the short rib on the roller plate gear, as shown in Fig. 7-14.

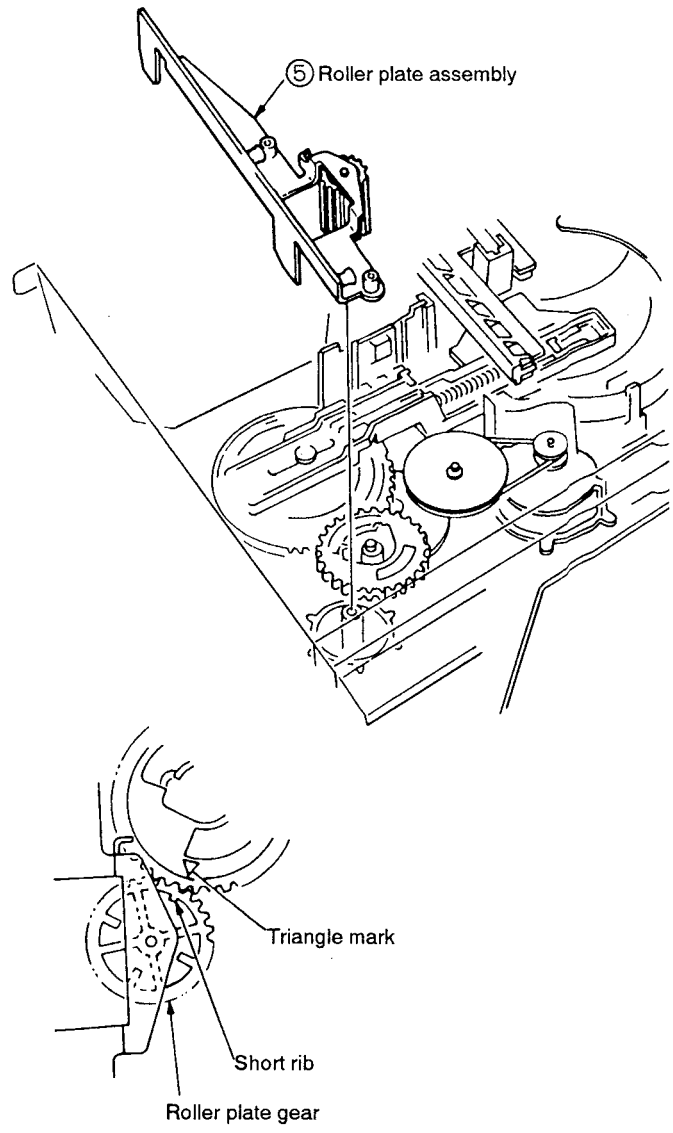


Fig. 7-14

7.10.2 Positioning the tray (Fig. 7-15)

① Set the player with the tray open.

② Set the roller plate gear so that the roller plate line intersects with the mid - point of missing tooth of the roller plate gear.
(At this time, adjust the position by the method shown in Fig. 7-15, or turn the power ON and use the SKIP (|◀◀, ▶▶|) buttons in the direction of OUT tilt it stops as shown in Fig. 7-15-1.)

③ Insert the tray.
At this time, the tray can be inserted only when the first missing tooth of the tray gear is engaged with the missing tooth section of the roller plate gear, as shown in the figure. (Fig.7-15-1)
Tray is easier to insert by pushing slightly upwards. (Fig.7-15-2)

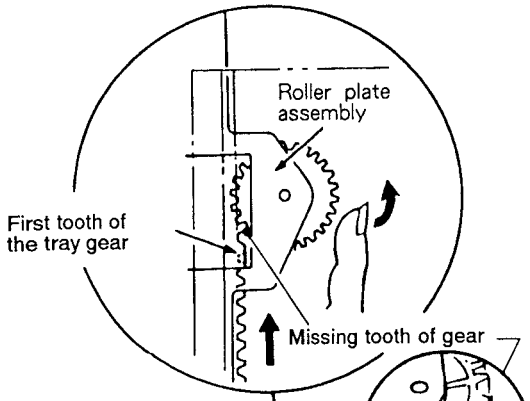


Fig. 7-15-1

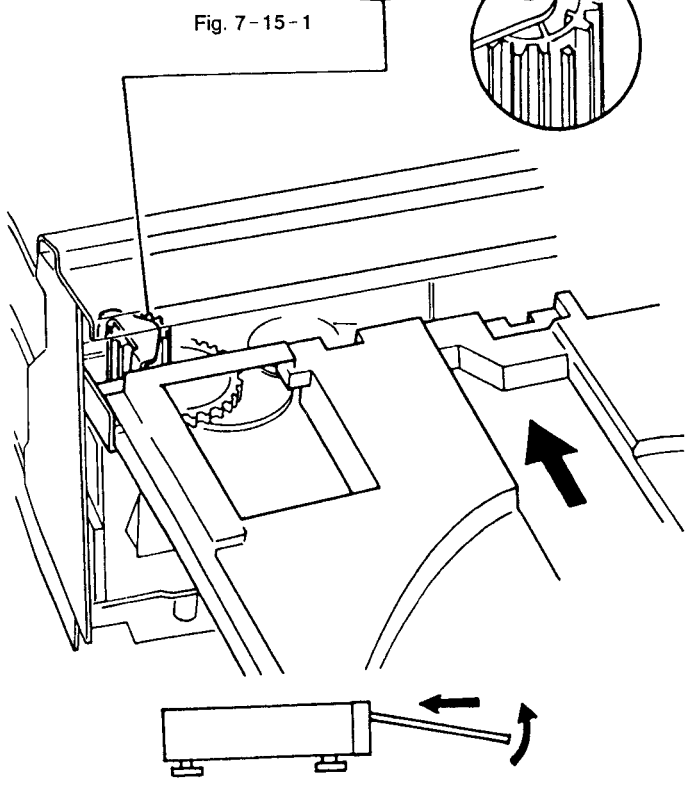


Fig. 7-15-2

7.10.3 Assembling the servo mechanism base assembly(Fig. 7-16)

When assembling the servo mechanism base assembly, pay special attention to the following points:

- After insertimg the tilt shaft in the position shown in Fig. 7-16-1 of mechanism chassis assembly, mount the servo mechanism base assembly in the direction of the arrow so that the tilt shaft does not come over the shaft holder as shown in Fig. 7-16-2.
- The thrust spring should not come over the shaft holder.
- Check that the end of the plate spring is inserted under the base.

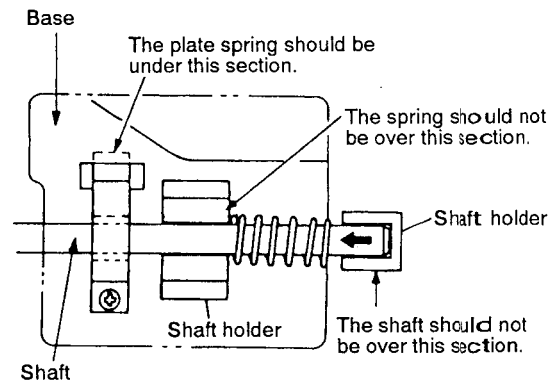


Fig 7-16-1

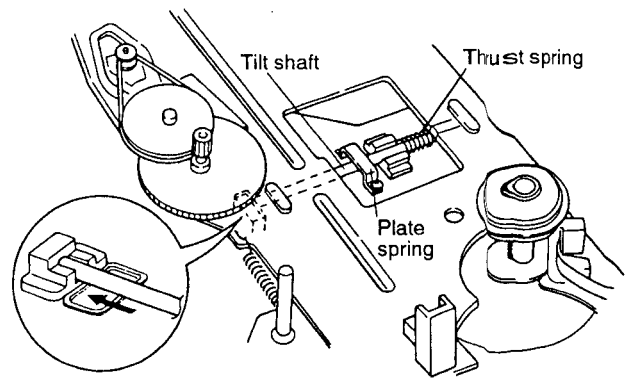


Fig. 7-16-2

7.10.4 Styling of the flexible cable (Fig. 7-17)

① Bend the flexible cable of the pickup assembly by about 45° at the ▲ mark.
② Insert the flexible cable into the connector.
③ Set the flexible cable under the protruding section.
④ Twist the flexible cable by a half turn.
⑤ Insert the triangular section.
⑥ Further insert the flexible cable under the protruding section.

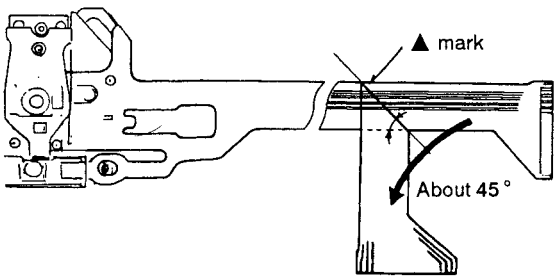


Fig. 7-17-1

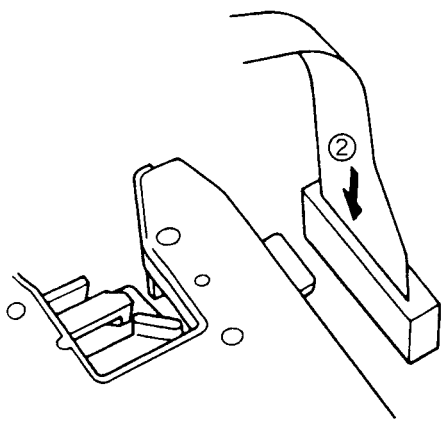


Fig. 7-17-2

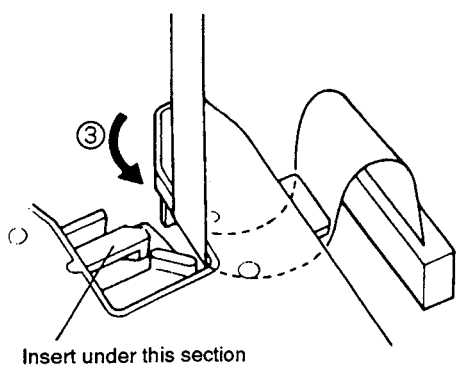


Fig. 7-17-3

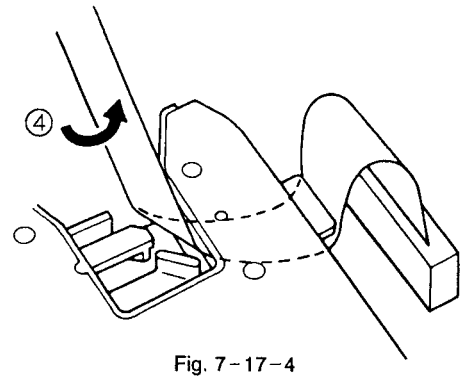


Fig. 7-17-4

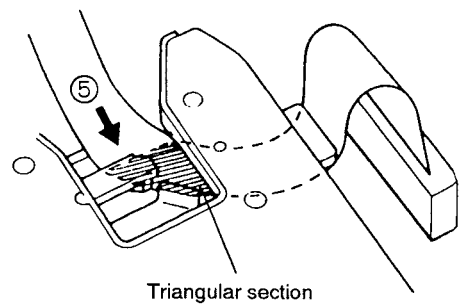


Fig. 7-17-5

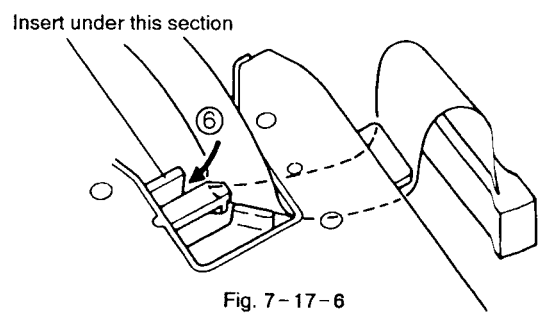


Fig. 7-17-6

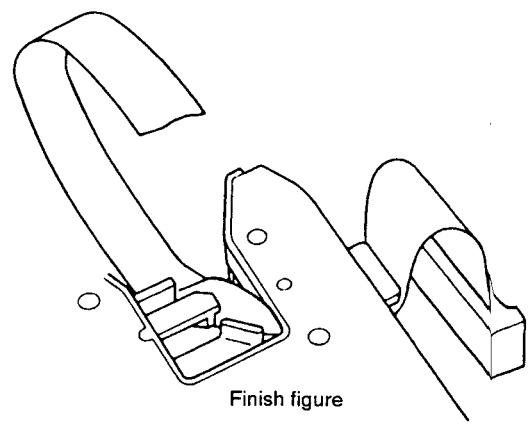


Fig. 7-17-7

7.11 DIAGNOSING THE SYPS ASSEMBLY (Fig. 7-18)

Procedure-1

1. Remove the screw fixing the SYPS assembly and keep the SYPS assembly apart about 3cm from the base chassis (See Fig. 7-18-1).

2. Insert a soldering iron between the SYPS assembly and base chassis, alternately desolder the lapping pins of an AC power cord, and remove the lapping pins (See Fig. 7-18-1).

3. Solder the lapping pins through the foil side of the board with the SYPS assembly raised.
   The SYPS assembly can be diagnosed for component replacement through the foil side.
   (See Fig. 7-18-2).

Notes:
1. Interpose cloth for check so that the SYPS assembly does not touch the chassis.
2. Remove the rear panel when you are difficult to work.

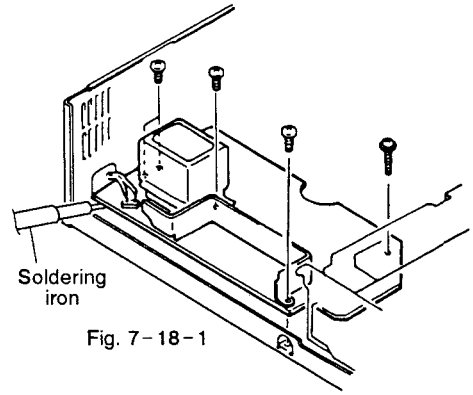


Fig. 7-18-1

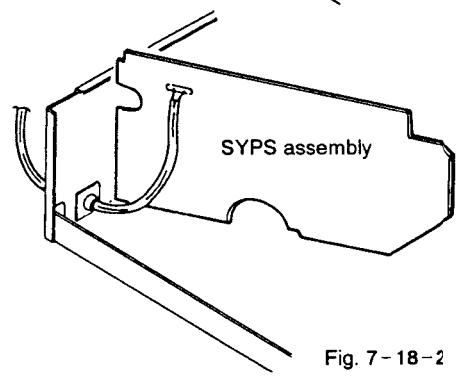
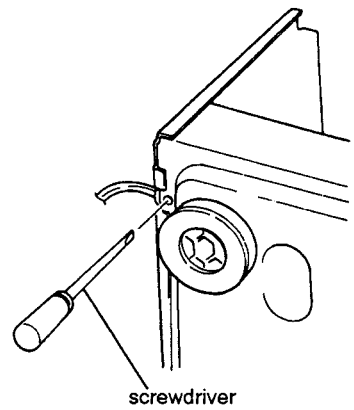


Fig. 7-18-2

Procedure-2

1. Insert a screwdriver into the chassis hole near a strain relief through the back of the base chassis and remove the strain relief stop ring.

2. Remove the strain relief and pull the AC power cord toward the main unit to set up the SYPS assembly.



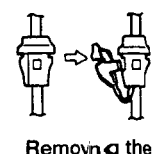


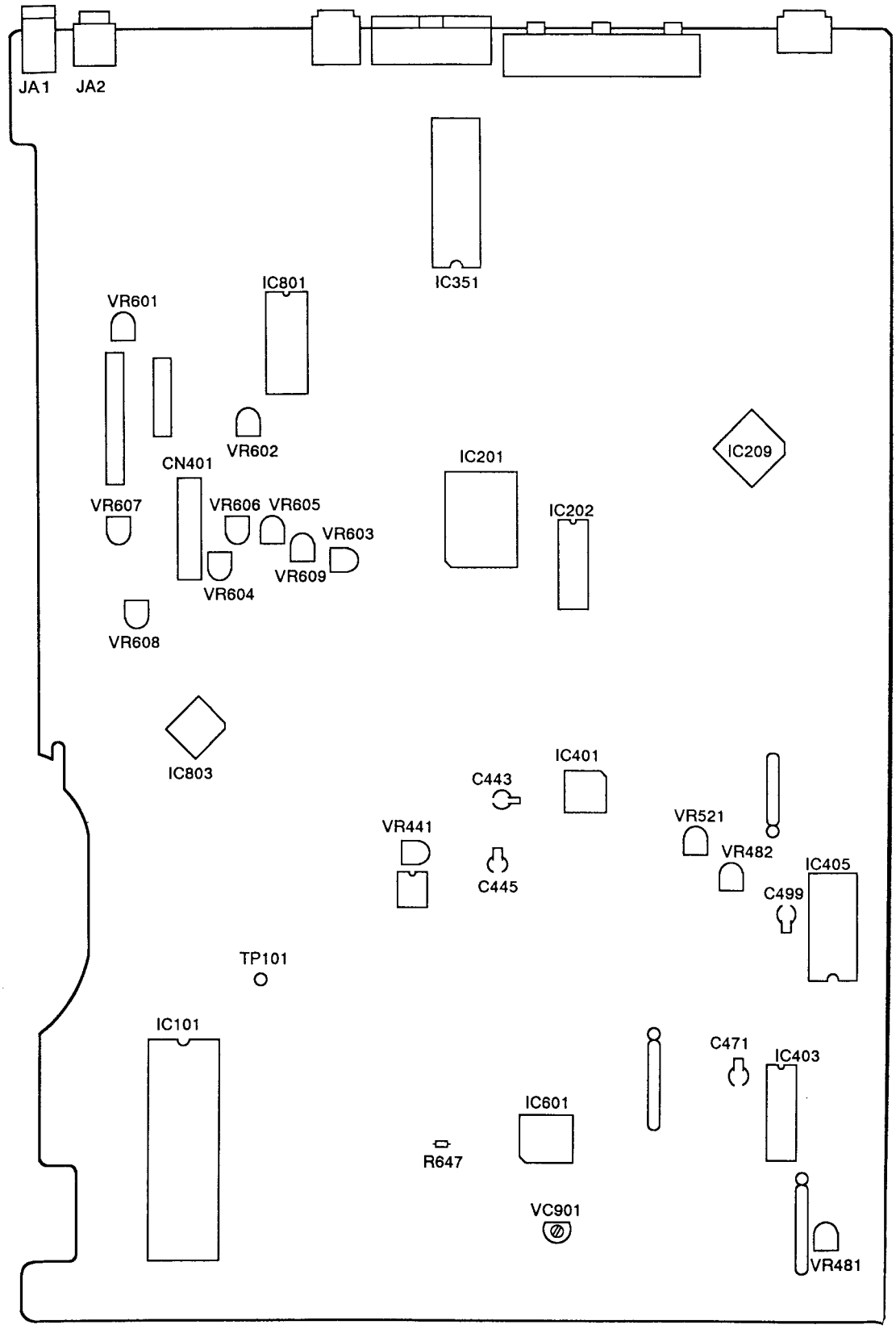
Fig. 7-19

8. ADJUSTMENT

8.1 MAIN ASSEMBLY ADJUSTMENT SUMMARY

	ADJUSTMENT	P	Adjusting Point	Measurement equipment Connecting Point	Player Condition	Adjusting Specification
1	Tilt Servo Gain Adjustment	75	VR608	None	Power off	• Making of Tilt GAIN VR position Red :Turn to Right Clear : Center Blue :Turn to Left
2	Coarse Adjustment of Grating and TRK Balance Adjustment	76	Grating/VR602	CN401-8 (TRK ERR)	• Test mode #15,000 TRK servo loop open	• Null point → TRK error MAX • Adjust VR602 so that the TRK error waveform amplitude's positive and negative level become equal.
3	Slider Shaft Horizontal Adjustment	77	Player SKIP key	CN401-2 (FCS RTN)	• Test mode Tilt servo loop off TRK servo loop open #5.200	• Use the SKIP key to adjust to 0V ± 20mV.
4	Pickup Inclination Adjustment	78	Pickup Assembly TAN / TRK inclination adjustment screw	CN401-1 (RF)	• Test mode #2,701 still TRK servo loop close /open Tilt servo loop open	• RF waveform's amplitude MAX (Pickup TAN / TRK adjustment screw) • Minimized crosstalk.
5	TRKG Error Best / Crosstalk Best Adjustment	79	VR605 (TE BEST) VR606 (CT BEST)	CN401-8 (TRK ERR) CN401-1(RF)	• Test mode TRK servo close / open Tilt servo loop off	• RF MAX (VR606) TRK error MAX (VR605)
6	FOCS SUM Level Adjustment	80	VR609	CN401-10 (FCS SUM)	• Play mode	• Adjust VR 609 so that the voltage becomes 1.5VDC.
7	Tilt Sensor Inclination / Tilt Balance Adjustment	81	Tilt sensor inclination adjustment screw VR607(TILT BAL)	TV monitor Test mode screen	• Test mode #16,200 / #115 still TRK servo loop close Tilt servo loop off	• Set VR 607 to the center. • Adjust the adjustment screw so that the tilt error display code is 6,7, or 8. • Adjust VR607 so that the tilt error display becomes 7.
8	Verification and Adjustment of Spindle Motor Centering	82	Spindle motor centering adjustment screw.	CH1:CN401-8 (TRK ERR) CH2:CN401-7 (TRK SUM) (X-Y mode)	• Test mode #25,000 / #1 TRK servo loop open Tilt servo loop on	• Adjust the centering adjustment screw so that the lissajous figures of #1 and #25,000 are the same.
9	Fine Adjustment of Grating and TRK Balance Adjustment	83	Grating / VR602	CH1:CN401-8 (TRK ERR) CH2:CN401-7 (TRK SUM) (X-Y mode)	• Test mode TRK servo loop open Tilt servo loop on	• Minimize the Y direction of the lissajous figure. • Level of the X direction of the lissajous figures are equal.
10	FCS Servo Loop Gain Adjustment	84	VR604	CH1:CN401-5 (FCS IN) CH2:CN401-4 (FCS ERR) (X-Y mode)	• Test mode #15,000 still TRK servo loop close Tilt servo loop on	• Adjust VR604 so that the lissajous figure is symmetric with respect to the X and Y axes.
11	TRK Servo Loop Gain Adjustment	85	VR603	CH1:CN401-9 (TRK IN) CH2:CN401-8 (TRK ERR) (X-Y mode)	• Test mode #15,000 still TRK servo loop close Tilt servo loop on	• Adjust VR603 so that the lissajous figure is symmetric with respect to the X and Y axes.
12	RF Gain Adjustment	86	VR601	CN401-1(RF)	• #15,000 still	• Adjust VR601 so that the RF level becomes 300mV ± 50mV.
13	Ref. Sub Carrier Adjustment	87	VC901	IC402 pin 8	• STOP	• Adjust VC901 so that the frequency becomes 3.579545 MHz.
14	VCO Center Frequency Adjustment	88	VR481	CH1:C471 + lead wire CH2:C499 + lead wire	• #5,100 still	• The center of CH1's video signal jitter is delayed by 71 μS with CH2's video signal.
15	Output Video Level Adjustment	89	VR482	VIDEO OUT terminal	• #19,900 still	• Adjust the VR482 so that the voltage between the sync tip and the white peak becomes 0.71V ± 5%.
16	1H Delay Video Level Adjustment	90	VR441	CH1:C443 – lead wire CH2:C445 – lead wire	• #3,800 still	• The 1H delay video level becomes the same as the main line video level.
17	VPS Error Adjustment	91	VR521	TV monitor	• #8,000 still	• Color irregularity on the magenta screen is minimized.

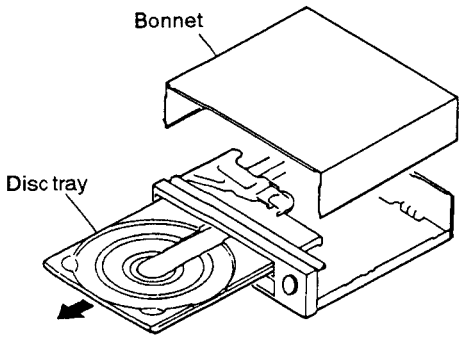
8.2 ADJUSTMENT POINTS OF THE MAIN ASSEMBLY



8.3 TEST MODE

8.3.1 TEST MODE

The player has a test mode function which allows the servicer to check the player's status on the TV screen by executing the respective key operation.
Also, since the TRK servo opens and closes easily, the test mode is especially useful for mechanical adjustments.



8.3.2 TEST MODE INITIATION

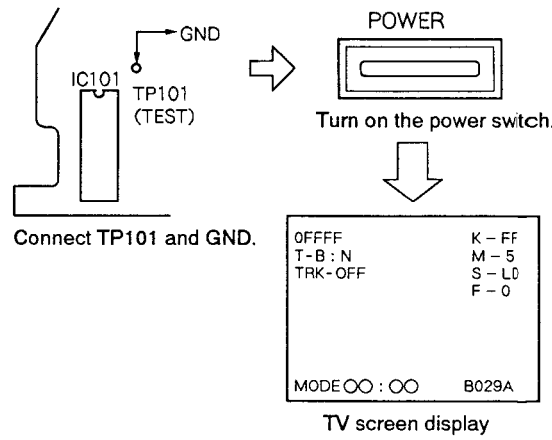
[Procedure]

Ⓐ When using the remote control unit (GGF1067) for the test mode.

- Press the TEST key after pressing the ESC key.

Ⓑ When not using the remote control unit (GGF1067) for the test mode.

1. Remove the bonnet and disc tray.
2. Connect the TP101 (TEST) in the MAIN assembly to GND.
3. Turn on the power switch.
4. Disconnect the TP101 from GND.



TV screen display

8.3.3 TEST MODE CANCELLATION

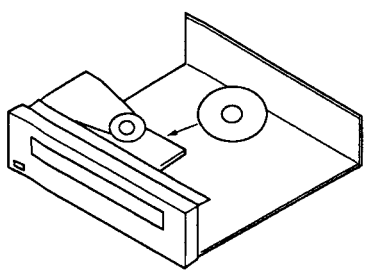
Turn off the power switch.

8.3.4 PLAYER OPERATION IN THE TEST MODE

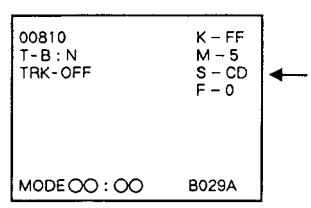
Operate the player by selecting a test mode function with the keys on the player or on the remote control unit.

- CD PLAYBACK

① Place the CD disc on the turn table. (Clamper is already lifted up.)



② Press the ◀◀ or ▶▶ key to appear "S-CD" on the TV screen display.

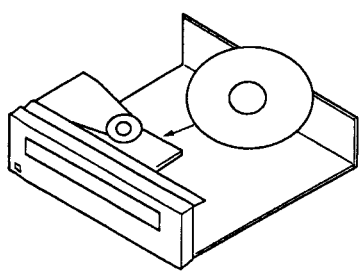


TV screen display

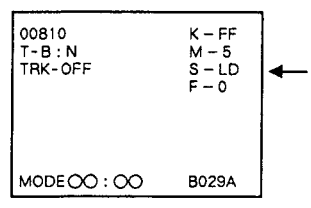
③ Clamp the disc by pressing the PLAY (▶) key once. Then, press the PLAY (▶) key twice, disc will be normal playbacked.

- LD PLAYBACK

① Place the LD disc on the turn table. (Clamper is already lifted up.)



② Press the ◀◀ or ▶▶ key to appear "S-LD" on the TV screen display.



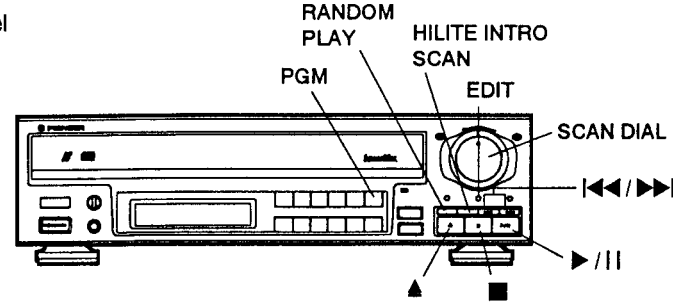
TV screen display

③ Clamp the disc by pressing the PLAY (▶) key once. Then, press the PLAY (▶) key twice, disc will be normal playbacked.

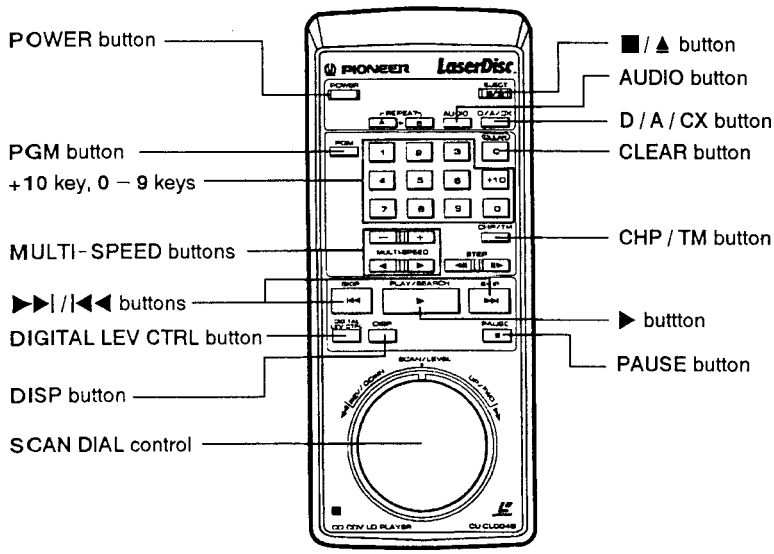
Table. Operation in the test mode by optional remote control unit (VXX1530).

Function	Player Status	Key Operation	Remarks
Open Tray	STOP mode	▲	
Close Tray	Tray open	▲	
Stop	PLAY mode	■	
Play	Disc placement and tray closed.	▶	• Start play with the TRK servo open. • Start play with tilt neutral. • The disc type (LD/CD/CDV) is determined when playback starts at the SLDR position during start play.
TRK Servo Open/Close	PLAY mode	▶	• Each time the PLAY button (▶) is pressed, the TRK servo will open or close alternately.
Still	PLAY mode TRK servo closed.	❚❚ (Remote control unit key)	• Each time the STILL button (❚❚) is pressed, the player will switch between the PLAY and STILL modes alternately.
SLDR REV SCAN	PLAY mode	SCAN DIAL	• Counterclockwise • With the TRK servo open, the pickup can be damaged if the SLD moves further inward than the lead-in area on the disc. Do not allow the SLD to move further inward than the lead-in area .
SLDR FWD SCAN	PLAY mode	SCAN DIAL	• Clockwise • With the TRK servo open, the pickup can be damaged if the SLD moves further outward than the lead-in area on the disc. Do not allow the SLD to move further outward than the lead-in area.
TILT Neutral	POWER switch ON	EDIT	
TILT Servo ON	PLAY mode	RANDOM PLAY	
TILT Minus TILT Servo OFF	PLAY mode	⏮	• Press and hold down the keys.
TILT Plus TILT Servo OFF	PLAY mode	⏭	• Press and hold down the keys.
Screen Display ON/OFF	POWER switch ON	PGM key	
Frame search	PLAY mode	+10 key ↓ 0-9 key ↓ ▶	• In the PLAY mode, press the +10 key. (The player will standby for the frame No. entry.) • Use the numeric keys(0 – 9) to enter the frame No.. Then press the player's PLAY key to search. • After the search is completed, the player will return to the previous mode before the search was performed.
Loading Motor Rotation Clockwise Counterclockwise	Tray open	⏭ ⏮	• FWD:Unloading • REV :Loading
FOCS OFFSET (CT BEST) VR606 Check	PLAY mode (TRK servo OPEN)	(Remote control unit) MULTI-SPEED FWD →F-1 REV →F-0 (Player) HILITE INTRO SCAN	• For checking VR604 F-0 : Normal mode •When closing the TRK servo, VR606 (CT BEST) is effectived. •When opening the TRK servo, VR605 (TE MAX) is effectived. F-1 : When opening the TRK servo, VR606 (CT BEST) is also effectived.

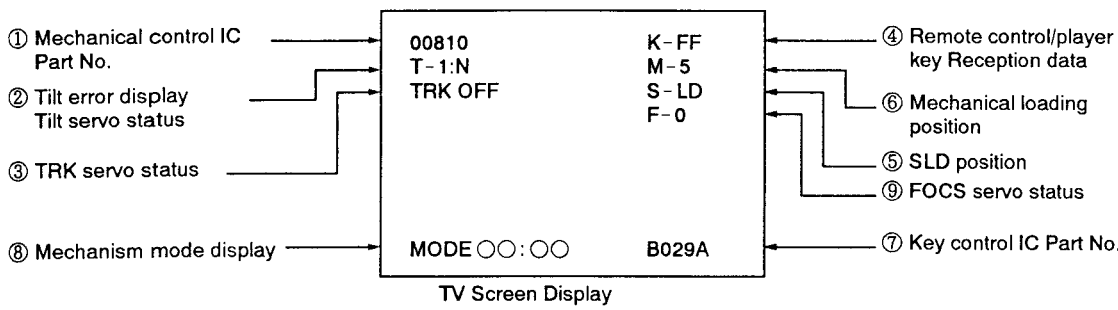
● Names of Front Panel



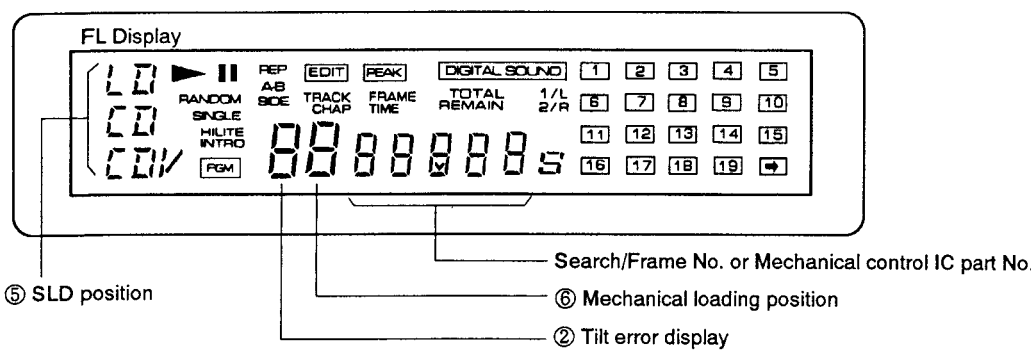
● Names of Remote Control Unit



8.3.5 TV SCREEN AND LED DISPLAYS IN THE TEST MODE



TV Screen Display



① The Mechanical Control IC (MAIN assembly) Part No. will be Displayed.

PD0081A1 → 00810

② Tilt Servo Status / Tilt Error Display

T-○:○○

- ○: Tilt error display: 0 Tilt –; ↕ Tilt neutral; F Tilt +
- ○○: Tilt servo status : N...Tilt neutral; ON...Tilt servo ON; OFF...Tilt servo OFF

③ TRK Servo Status

TV screen display

TRK-○○○

└—ON...TRK servo close

OFF...TRK servo open

④ Remote Control / Player Key Reception Data

TV screen display

K-○○

└—See table below

Code	Function	Code	Function	Code	Function	Code	Function
00	0	20	F JOG0	40	(CHAP / TRK)	60	
01	1	21	F JOG1	41	(FRAM / TIM)	61	
02	2	22	F JOG2	42	(SEARCH)	62	
03	3	23	F JOG3	43	DISPLAY	63	
04	4	24	R JOG0	44	REPEAT B	64	
05	5	25	R JOG1	45	CLEAR	65	
06	6	26	R JOG2	46	SPEED –	66	
07	7	27	R JOG3	47	SPEED +	67	
08	8	28		48	REPEAT A	68	
09	9	29		49	(2 / R)	69	
0A	VOLUME +	2A		4A	(STEREO)	6A	
0B	VOLUME –	2B		4B	(1 / L)	6B	
0C	DGT / ANL	2C		4C	PROGRAM	6C	
0D		2D		4D		6D	PLAY /PAUSE
0E	CX ON/OFF	2E		4E		6E	STOP
0F	(TV / LDP)	2F		4F		6F	OPEN / CLOSE
10	(F-SCAN)	30		50	F-STEP	70	
11	(R-SCAN)	31		51		71	DIRECT CD
12		32		52	F-SKIP	72	PEAK
13	CHAP / FRME	33		53	R-SKIP	73	SINGLE
14		34		54	R-STEP	74	
15		35		55	R-MULT	75	
16	STOP / OPEN	36		56		76	
17	PLAY/SERCH	37	DGT LEVEL	57		77	
18	PAUSE	38		58	F-MULT	78	
19		39		59		79	
1A	(POW ON)	3A		5A	HILIT / INTR	7A	
1B	(POW OFF)	3B		5B		7B	
1C	POW ON/OFF	3C		5C		7C	
1D	EDIT	3D		5D		7D	
1E	AUDIO	3E		5E	RNDM (TEST)	7E	
1F	+10	3F		5F	(ESC)	7F	

⑤ SLD Position

TV screen display

S-○○○

└— IN ... CD inside SW ON

CD ... CD active area

CDV ... CDV active area

LD ... LD active area

⑥ Mechanical Loading Position

TV screen display

M-○

└— 0 ... Tray open

1 ... Loading

2 ... Standby

3 ... Clamped

5 ... Tilt minus

6 ... Tilt neutral (one side)

7 ... Tilt plus

8 ... Tilt limit

9 ... B side clamped (two sides)

⑦ Focus Offset VR Status

TV screen display

F-○

└— 0 ... Normal mode

•When closing the TRK servo, VR606 (CT BEST) is effectived.

•When opening the TRK servo, VR605 (TE MAX) is effectived.

1 ... When opening the TRK servo, VR606 (CT BEST) is also effectived.

8.4 ADJUSTMENTS

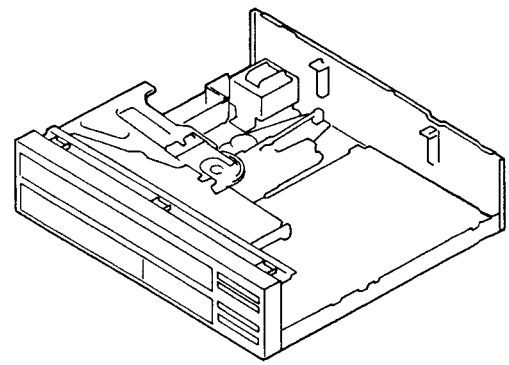
8.4.1 Required Instruments

- Small screwdriver (7 cm shaft)
- Small Phillips screwdriver (15 cm shaft)
- Low-pass filter (47k ohms+1 μF / BP)
- Dual-trace oscilloscope (with delay)
- AF oscillator
- Frequency counter
- LD test disc (GGV1003)
- 8-inch LDD disc
- CDV disc
- Short clip
- TV monitor
- Resistor (100k ohms, 330k ohms)
- Capacitor (0.01 μF)
- Remote control unit
- 2mm hexagonal wrench

8.4.2 Adjustment Preparation and Notes

1. Player Preparation

Befor perform the adjustment, remove the bonnet and the disc tray. Then place the player horizontally on a flat surface.



2. Disc Insertion

Insert the disc from the rear of the player. Place it securely on the turntable. When the PLAY key is pressed, the clamper will go down and secure the disc. Playback will then begin.

3. Use All the Oscilloscope's Probes at 10:1.

4. Only the MAIN Assembly Needs to be Adjusted.

Unless noted otherwise, all adjustment items and measuring instrument connections will be for the parts in the MAIN assembly.

5. Required adjustment after Replacement of major parts.

Adjustments	Replacements				
	Pickup	Actuator	Pre-pickup	Spindle motor	Tilt sensor
1. Tilt Sensor Adjustment	◎				◎
2. Coarse Grating Adjustment / TRK Balance Adjustment	◎	◎	◎		
3. Slider Shaft Horizontal Adjustment	◎	◎	◎	○	◎
4. Pickup Inclination Adjustment	◎	◎	◎	○	○
5. TRKG Error Best / Crosstalk Best Adjustment	◎	◎	◎	○	○
6. FOCS SUM Level Adjustment	◎	◎	◎	○	○
7. Tilt Sensor Inclination / Tilt Balance Adjustment	◎	◎	◎	○	◎
8. Spindle Motor Shaft Centering and Adjustment	◎	◎	◎	◎	
9. Fine Grating Adjustment / TRK Balance Adjustment	◎	◎	◎		
10. FCS Servo Loop Gain Adjustment	◎	◎	◎		
11. TRKG Servo Loop Gain Adjustment	◎	◎	◎		
12. RF Gain Adjustment	◎	◎	◎		

Note: Adjustments indicated by a ○ are made only when there is crosstalk.

8.4.3 MECHANICAL ADJUSTMENTS

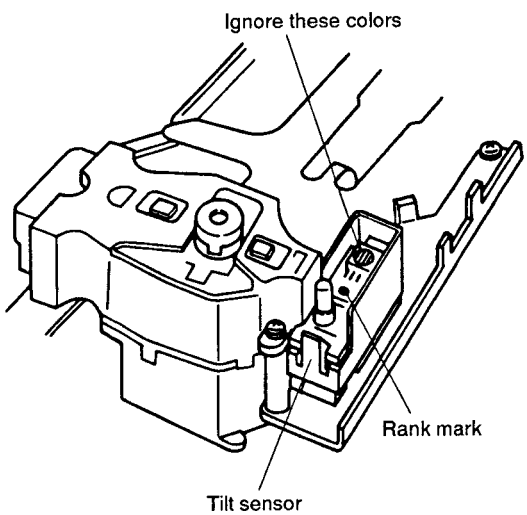
1. TILT SERVO GAIN ADJUSTMENT

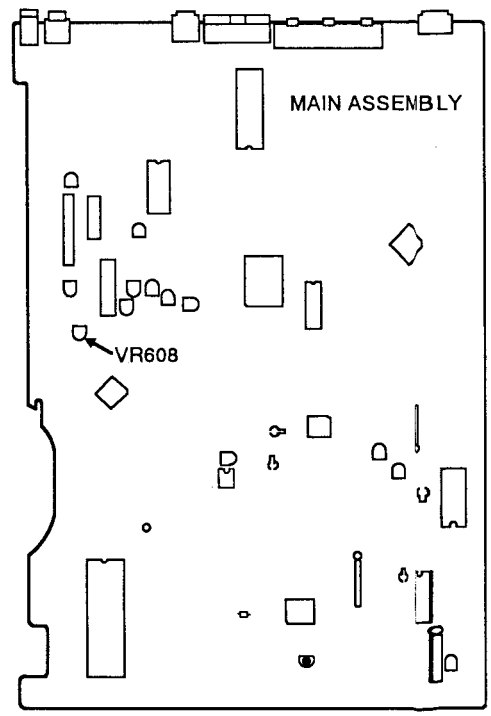
Mechanical Adjustment

- Purpose: Adjustment of the tilt servo's gain according to the tilt sensor's sensitivity rank.
- When not properly adjusted: Increased tilt servo hunting and increased crosstalk.

• Measuring instruments and jigs: • Measuring point: • Test disc and player mode	• Small screwdriver
• Positions to be adjusted	• VR608

Connection diagram





Adjustment Procedure

1. Use a screwdriver to adjust the angle of VR608 on the MAIN assembly according to the rank indicator's color.

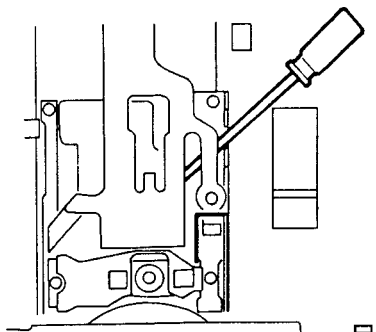
Rank	Color	VR Angle
A	Red	Clockwise all the way
B	Clear	Mechanical center
C	Blue	Counterclockwise all the way

2. COARSE ADJUSTMENT OF GRATING AND TRK BALANCE

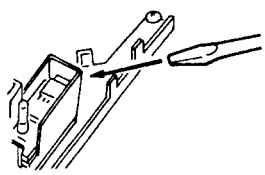
- Purpose: Adjustment of the grating angle to enable disc playback and trick playback.
- When not properly adjusted: The disc cannot be played back. Track skipping occurs.

• Measuring instruments and jigs:	• TV monitor • Small screwdriver • Oscilloscope
• Measuring point:	• CN401 - 8 (TRK ERR) and GND
• Test disc and player mode	• 8 - inch LD test disc (GGV1003) • Test Mode (Disc playback, TRK servo open, Tilt servo OFF)
• Positions to be adjusted	• Pickup assembly grating • VR602 (TRK BAL).

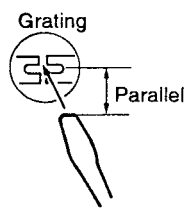
Connection diagram

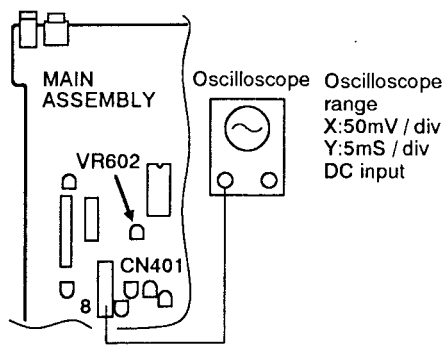


(Top view)
Screwdriver inserting direction



Insert the screwdriver to the slot horizontally for the base.





Oscilloscope range
X:50mV / div
Y:5mS / div
DC input

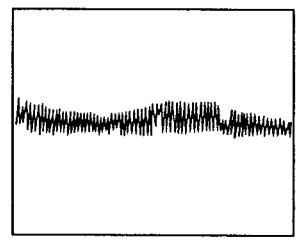


Fig.1 Null Point

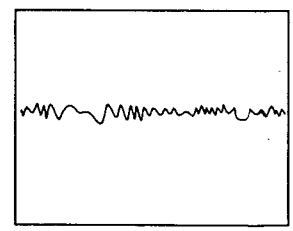


Fig.2 This is not the null point.

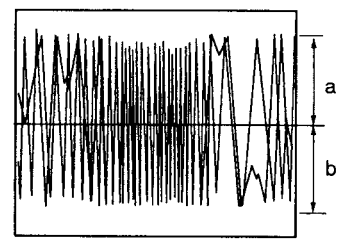


Fig.3 Maximum TRK error.

The positive and negative levels are equal.

Adjustment Procedure

Coarse grating adjustment

1. Insert the test disc and press the PLAY key.
2. Search for frame #15,000 or thereabouts.
3. Open the TRK servo.
4. Connect CN401 - 8 to the oscilloscope and observe the waveform.
5. Slide the tip of a small screwdriver through the guide and insert it horizontally into the grating adjustment slit. Adjust grating angle so that the waveform becomes small a its envelope is smooth. (This point is called null point.) (See Fig. 1 and Fig. 2.)
6. Turn the screwdriver counterclockwise untill the TRK waveform's amplitude reaches the first maximum from the null point.(See Fig. 3.)

TRK balance adjustment

1. Adjust VR602 so that the TRK error waveform amplitude's positive and negative level become equal. (See Fig.3.)
2. Close the TRK servo and check if the image on the TV screen is normal.

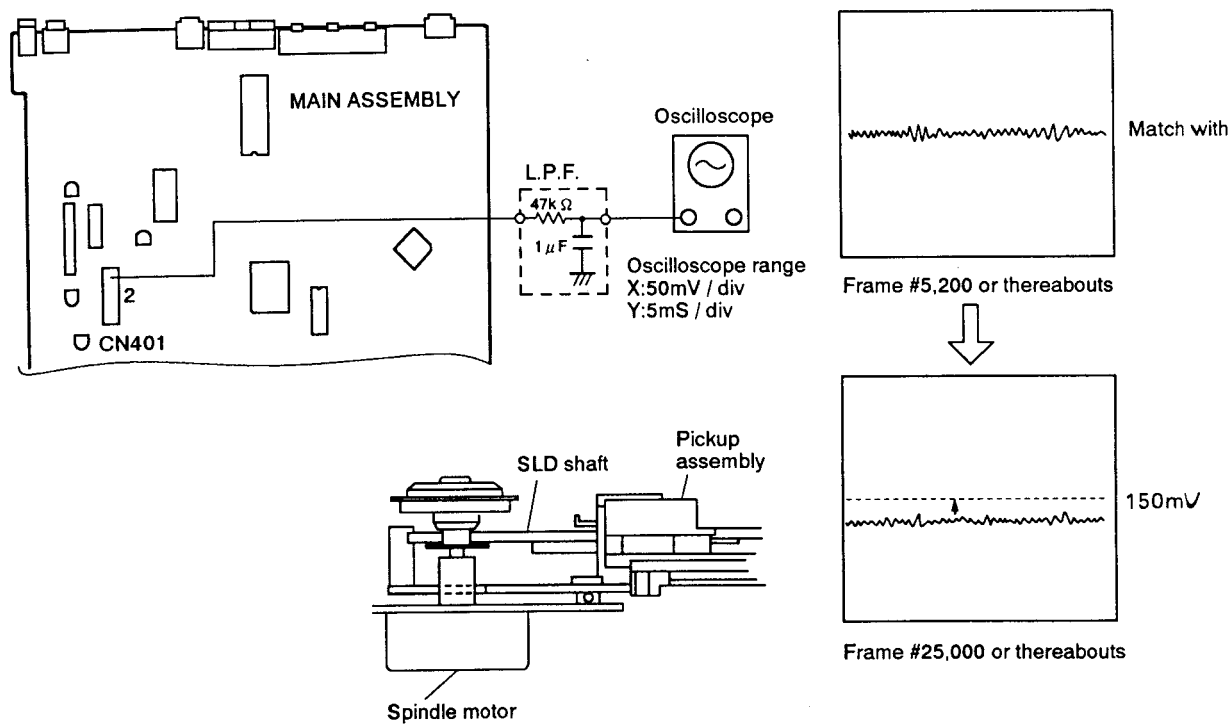
3. SLIDER SHFT HORIZONTAL ADJUSTMENT

Mechanical Adjustment

- Purpose: Setting the slider shaft horizontally to enable the pickup to move over the disc horizontally.
- When not properly adjusted: With a warped disc, the FCS servo does not function at the inner or outer periphery.

• Measuring instruments and jigs:	• Oscilloscope • Low-pass filter (47k Ω + 1 μF)
• Measuring point:	• CN401 - 2 (FCS RTN) and GND
• Test disc and player mode	• 8 - inch LD test disc GGV1003 • Test mode (#5,200 still, TRK servo open, Tilt servo OFF)
• Positions to be adjusted	• Player SKIP key (In the test mode)

Connection diagram



Adjustment Procedure

1. Use the SCAN key to send the slider to frame #5,200 or thereabouts (tilt fulcrum) on the test disc. Open the TRK servo.
2. Connect the oscilloscope to CN401 - 2 through L.P.F. and match the center of the waveform with the oscilloscope's GND.
3. Search for frame #25,000 and use the SKIP key to adjust the center of the waveform to 150mV ± 20mV.

Note : Regarding the test mode, see page 70.

Note : This adjustment is critical in that it will affect the adjustments following.

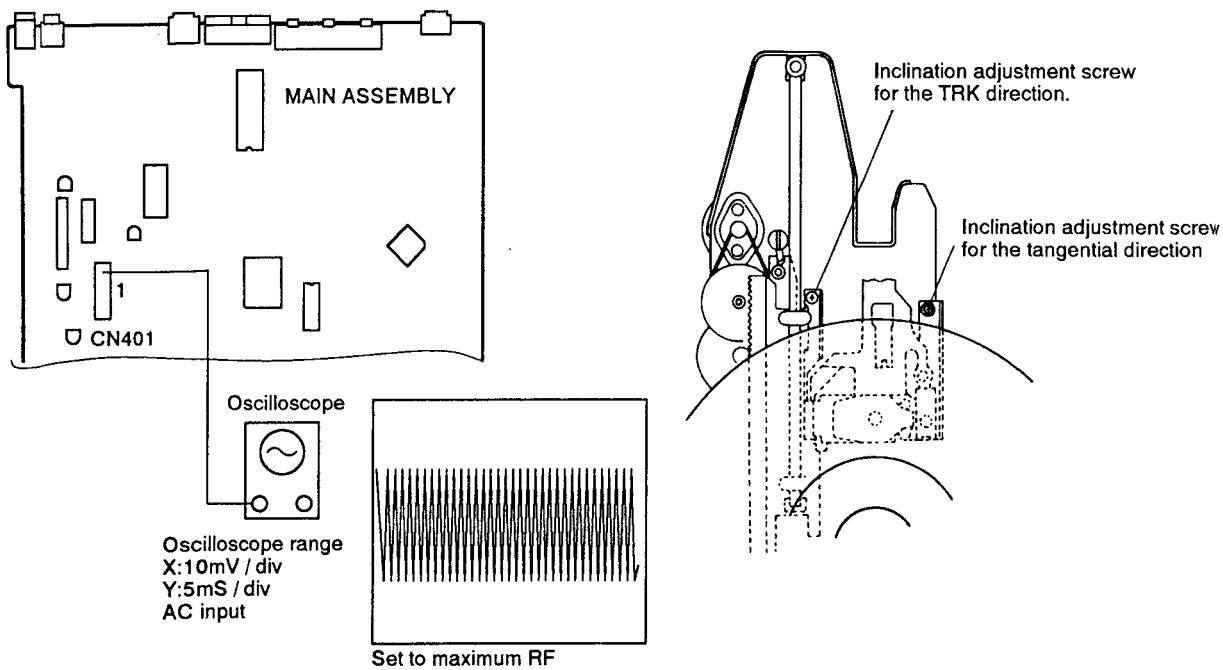
4. PICKUP INCLINATION ADJUSTMENT

Mechanical Adjustment

- Purpose: Adjustment of the pickup inclination to direct the laser beam vertically with respect to the disc.
- When not properly adjusted: Crosstalk will be generated.

• Measuring instruments and jigs:	• TV monitor • Oscilloscope
• Measuring point:	• CN401 - 1 (RF)
• Test disc and player mode	• 8 - inch LD test disc (GGV1003) • Test Mode (#2,701 still (Black screen))
• Positions to be adjusted	• Pickup assembly TRK / Tangential direction inclination adjustment screws

Connection diagram



Adjustment Procedure

1. Connect the oscilloscope to CN401 - 1.
2. Search for #2,701 and observe the RF waveform.
3. Adjust the pickup's TRK / Tangential direction inclination adjustment screw to maximize the waveform's amplitude.
4. Look at the TV screen and make sure there is no crosstalk.

Note: If there is crosstalk on the TV screen even when the RF level is at the maximum, perform next steps .

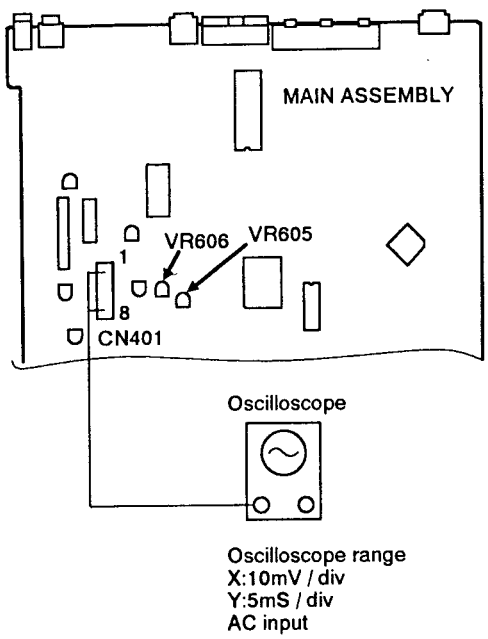
5. TRKG ERROR MAX / CROSSTALK BEST ADJUSTMENT

Mechanical Adjustment

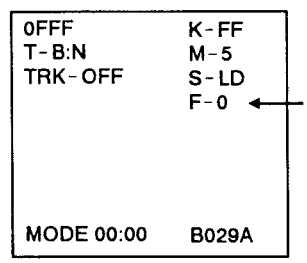
- Purpose: To set the FOCS servo to the optimum state when playing the normal playback and track jump (search).
- When not properly adjusted: Crosstalk will be generated.

• Measuring instruments and jigs: • Measuring point: • Test disc and player mode	• TV monitor • Oscilloscope • CN401-1 (RF) • CN401-8 (TRK ERR) • Player's VIDEO OUT terminal • 8-inch LD test disc (GGV1003) • Test Mode (TRK servo close / open, Tilt servo OFF)
• Positions to be adjusted	• VR605 (TE MAX) • VR606 (CT BEST)

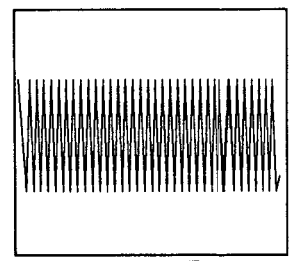
Connection diagram



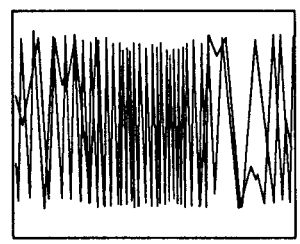
Oscilloscope range
X:10mV / div
Y:5mS / div
AC input



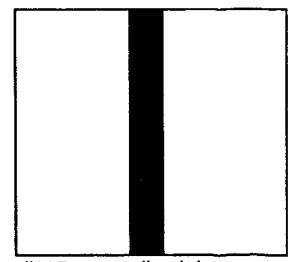
Screen display of test mode



Set to maximum RF amplitude at frame #2,701.



Maximize the TRKG error.



#115 crosstalk minimum

Adjustment Procedure

Note : Perform this adjustment when there is still noticeable crosstalk on the TV screen in section "4. Pickup Inclination Adjustment".

1. Connect the oscilloscope to CN401-8.
2. Open the TRK servo.
3. Confirm that the test mode screen display is F-0.
   If not, set the MULTI-SPEED REV button of the remote control unit to F-0.
4. Adjust VR605 so that the amplitude of the TRKG error waveform becomes maximum.
5. Close the TRKG servo.
6. Connect the oscilloscope to CN401-1.
7. Press the MULTI-SPEED FWD button of the remote control unit to display "F-1" on the TV screen.
8. Search frame #2,701 and adjust VR606 so that the amplitude of the RF waveform becomes maximum.
9. Confirm that the crosstalk on the TV screen becomes minimum at frame #115.

Note : After adjustment is complete, be sure to perform "6. FOCS SUM Level Adjustment".

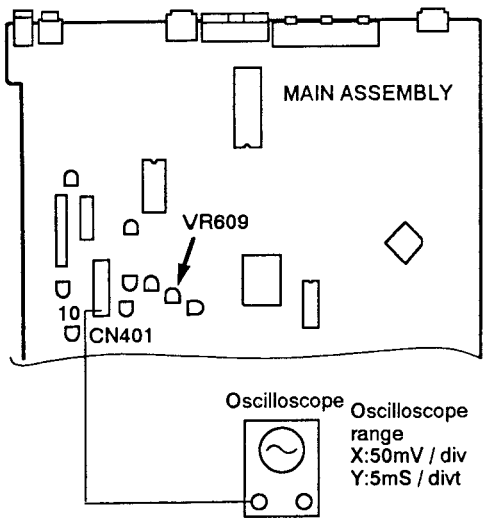
6. FOCS SUM LEVEL ADJUSTMENT

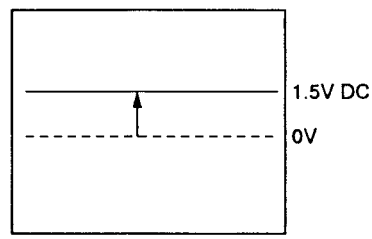
Mechanical Adjustment

- Purpose: To set the sum level (FOCS A+B) of B1 – B4 to the optimum value for activating the FOCS servo.
- When not properly adjusted: Crosstalk will be generated.

• Measuring instruments and jigs:	• TV monitor • Oscilloscope
• Measuring point:	• CN401 - 10
• Test disc and player mode	• 8 - inch LD test disc (GGV1003) • Normal play mode
• Positions to be adjusted	• VR609

Connection diagram





Adjustment Procedure

Note : Perform this adjustment after perform the "5. TRKG Error MAX / Crosstalk Best Adjustment".

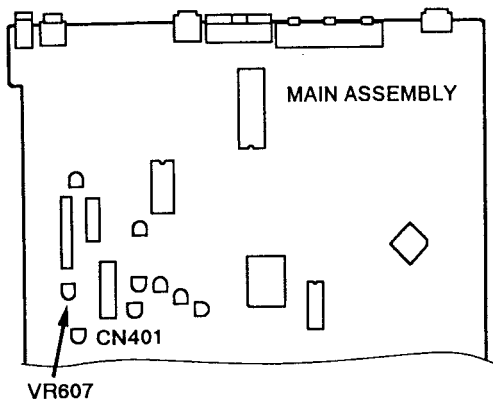
1. Connect the oscilloscope to CN401 - 10.
2. Adjust VR609 so that the voltage becomes 1.5V DC.

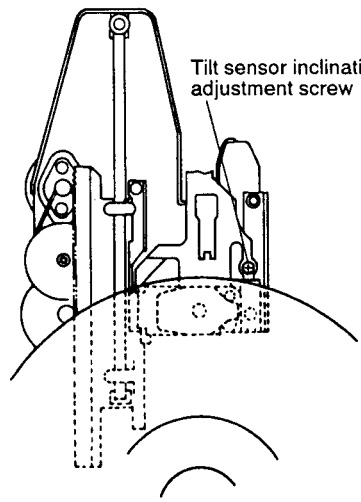
7. TILT SENSOR INCLINATION / TILT BALANCE ADJUSTMENT

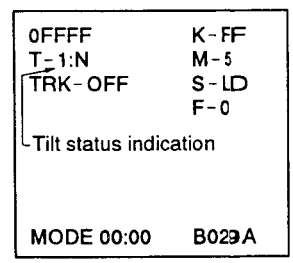
- Purpose: Adjustment of the tilt sensor's inclination to direct the tilt sensor's LED vertically with respect to the disc. Also, compensation for the sensitivity difference between the two sensors.
- When not properly adjusted: Crosstalk will be generated.

• Measuring instruments and jigs:	• TV monitor • Small Phillips screwdriver
• Measuring point:	• Player's VIDEO OUT terminal
• Test disc and player mode	• 8-inch LD test disc (GGV1003) • Test Mode (#16,200 still, TRK servo closed, Tilt servo OFF)
• Positions to be adjusted	• Tilt sensor inclination adjustment screw • VR607 (TILT BAL).

Connection diagram







TV screen display

Note: This display indicates the tilt error display's location. Other displays may differ slightly from the actual.

Adjustment Procedure

1. Search for frame #16,200 on the test disc.
2. Set VR607 to the mechanical center.
3. Adjust the tilt sensor inclination adjustment screw so that the tilt status display code is 6, 7, or 8 on the TV monitor.

Note : Turn the tilt sensor inclination adjustment screw clockwise more than 1/4 turn to complete the adjustment.

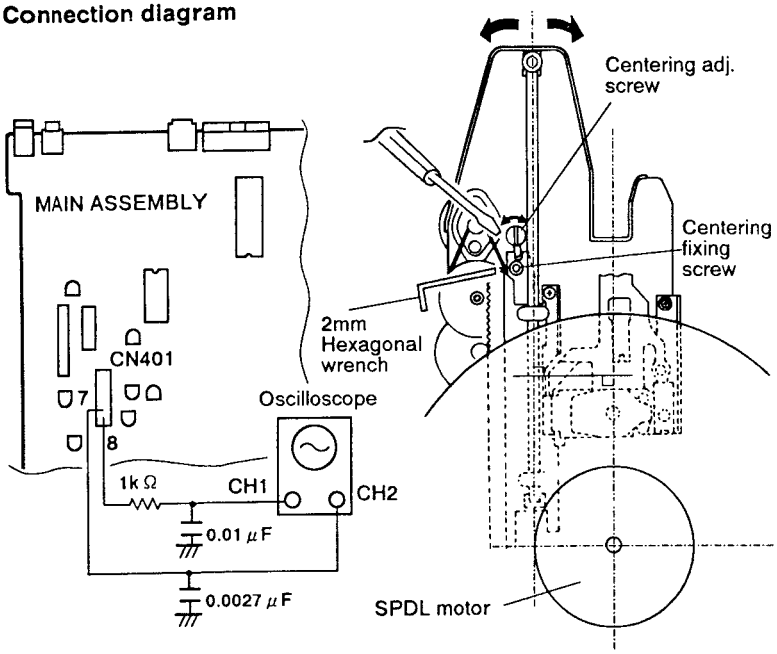
4. Search for frame #115.
5. Adjust VR607 so that the tilt error display becomes 7.

8. VERIFICATION AND ADJUSTMENT OF SPINDLE MOTOR CENTERING

- Purpose: Adjustment of the mechanical assembly position to set the spindle motor over the center of the laser beam path when the pickup assembly moves toward the inner or outer periphery of the disc.
- When not properly adjusted: There is track skipping and the search time is long.

• Measuring instruments and jigs: • Measuring point: • Test disc and player mode	• Oscilloscope • Small screwdriver • L.P.F. (0.01 μF + 1k Ω), (0.0027 μF) • 2mm Hexagonal wrench • CH1 : CN401 - 8 (TRK ERR), CH2 : CN401 - 7 (TRK SUM) • 8 - inch LD test disc (GGV1003) • Test Mode (#25,000 still, #1 still, TRK servo open, TILT servo ON)
• Positions to be adjusted	• Spindle motor centering adjustment lever

Connection diagram



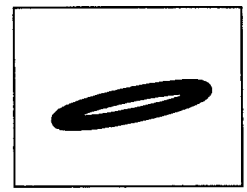


Fig. 1 Frame #25,000 lissajous

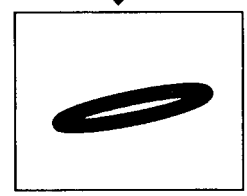


Fig. 2 Frame #1 lissajous

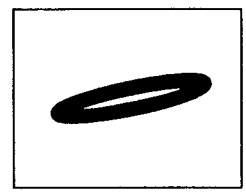


Fig. 3
CD inner periphery lissajous figure

X - Y mode
CH1: 50mV/div.
CH2: 5mV/div. AC

Adjustment Procedure

Note:Adjust the position of the slider shaft against the center line of the SPDL motor in this adjustment.

1. Set the oscilloscope to the X - Y mode and connect CH 1 (X input) and CH 2 (Y input) to CN401 - 8 and CN401 - 7 respectively.
2. Search for frame #25,000 on the test disc and look at the lissajous figure.
3. Search for frame #1 and check if the bulge of the lissajous figure is the same as that of frame #25,000's lissajous figure.

Note: If the bulge of the lissajous waveform in step 3 differs for the inner and outer peripheries, do steps 4 to 6 .

4. Search for frame #25,000 and #1 alternately. Loosen a centering fixing screw and adjust the spindle motor centering adjustment screw so that the bulge of the lissajous figures become identical.
5. Change to a compact disc and playback the inner periphery. Check if the lissajous figure is the same as the one shown in Fig. 3.
6. If the compact disc's inner periphery lissajous figure differs from the one shown in Fig. 3, repeat steps 4 to 5.
7. Fix the centering fixing screw.

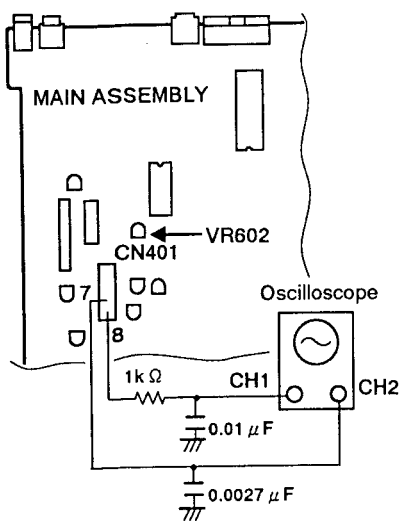
9. FINE ADJUSTMENT OF GRATING AND TRK BALANCE ADJUSTMENT

Mechanical Adjustment

- Purpose: Fine adjustment of the grating to direct the two TRK servo laser beams at the disc at the optimum position over the track.
- When not properly adjusted: There is track skipping.

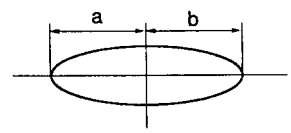
• Measuring instruments and jigs:	• Oscilloscope • Small screwdriver • L.P.F. (0.01 μF + 1k Ω), (0.0027 μF)
• Measuring point:	• CH1 (X) : CN401 - 8 (TRK ERR), CH2 (Y) : CN401 - 7 (TRK SUM)
• Test disc and player mode	• 8 - inch LD test disc (GGV1003) • Test Mode (Play mode, TRK servo loop open, TILT servo ON)
• Positions to be adjusted	• Grating slit in the pickup assembly • VR602

Connection diagram



Set the probe to × 1 only for Y.

- Oscilloscope range:
  CH1 (X): 50mV / div.
  CH2 (Y): 5mV / div. X - Y mode



Frame #2,000
Lissajous figure
Y direction minimum, a=b.

Adjustment Procedure

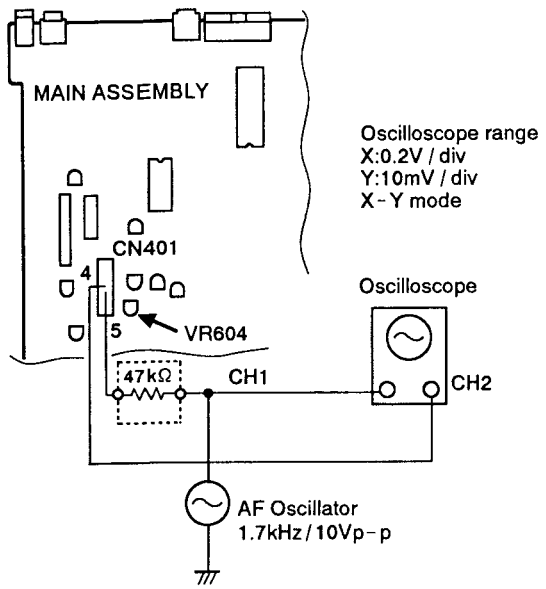
1. Playback the test disc at frame #3,000 (inner periphery) or thereabouts.
2. Set the oscilloscope to the X - Y mode, and connect CN401 - 8 (TRK ERR) and CN401 - 7 (TRK SUM) to the X input and the Y input respectively. Then observe the lissajous figure.
3. Insert the small screwdriver tip into the grating adjustment slit. Fine adjust the grating to minimize the Y direction of the lissajous figure. (Refer to adjustment diagram on page 76.)
4. Check if "a " equals "b" for the lissajous figure. If "a" is not equal to "b", adjust VR602 (TRK BAL).
5. Close the TRK servo loop and check if the image on the TV screen is normal.

10. FCS SERVO LOOP GAIN ADJUSTMENT

- Purpose: Setting the FCS servo's loop gain to the optimum setting.
- When not properly adjusted: Playability is poor.

• Measuring instruments and jigs:	• Oscilloscope • AF oscillator (1.7kHz / 10Vp-p) • Resistor (47k Ω)
• Measuring point:	• CH1 (X) : CN401 - 5 (FCS IN), CH2 (Y) : CN401 - 4 (FCS ERR)
• Test disc and player mode	• 8 - inch LD test disc (GGV1003) • Test Mode (Still mode, TRK servo loop close, TILT servo ON)
• Positions to be adjusted	• VR604

Connection diagram



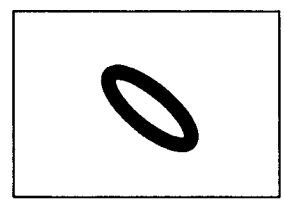


Fig. 1
Inadequate adjustment

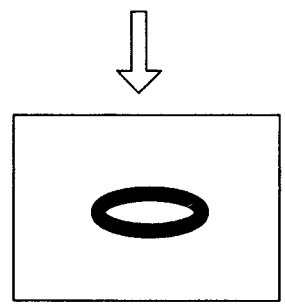


Fig. 2
After adjustment

Adjustment Procedure

1. Search for frame #15,000 on the test disc.
2. Connect the oscilloscope to CN401 - 4 and CN401 - 5 as shown above.
3. Set the oscilloscope to the X - Y mode and observe the lissajous figure.
4. Adjust VR604 so that the lissajous figure is symmetric with respect to the X and Y axes. (See Fig. 1 and 2.)

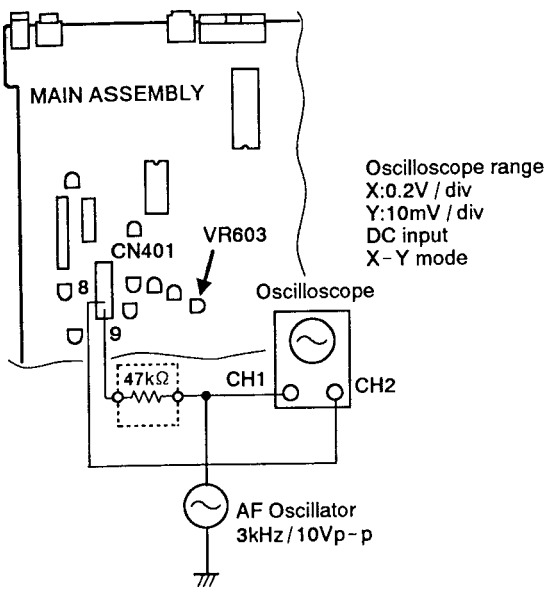
11. TRK SERVO LOOP ADJUSTMENT

Mechanical Adjustment

- Purpose: Optimum setting of the TRK servo's loop gain.
- When not properly adjusted: Playability is poor.

• Measuring instruments and jigs:	• Oscilloscope • AF oscillator (3.0kHz / 10Vp-p) • Resistor (47k Ω)
• Measuring point:	• CH1 (X) : CN401-9 (TRK IN), CH2 (Y) : CN401-8 (TRK ERR)
• Test disc and player mode	• 8-inch LD test disc (GGV1003) • Test Mode (Still mode at #15,000 (Black screen), TRK servo closed, TILT servo ON)
• Positions to be adjusted	• VR603

Connection diagram



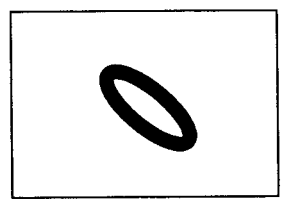


Fig. 1
Inadequate adjustment

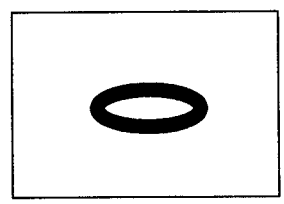


Fig. 2
After adjustment

Adjustment Procedure

1. Search for frame #15,000 on the test disc.
2. Connect the oscilloscope to CN401-9 (TRK IN) and CN401-8 (TRK ERR) as shown in the diagram below.
3. Set the oscilloscope to the X-Y mode and observe the lissajous figure.
4. Adjust VR603 to make the lissajous figure symmetrical with respect to the X and Y axes. (See Fig. 1 and 2.)

Note : If the waveform is not observable, either change the 47kΩ resitor to 33kΩ or increase the oscillator's output.

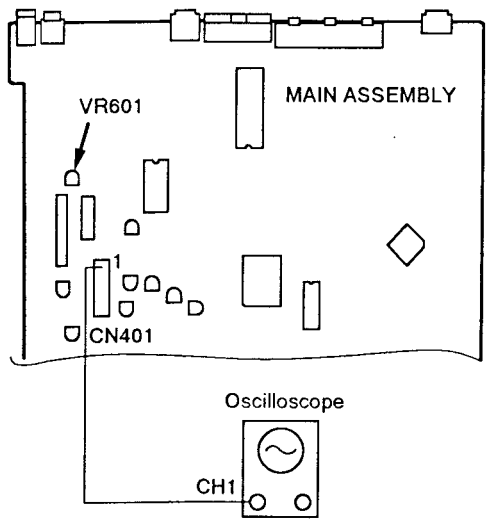
12. RF GAIN ADJUSTMENT

Mechanical Adjustment

- Purpose: Optimum of the RF signal's amplitude.
- When not properly adjusted: There is prominent dropout. Scan and search operations are unstable.

• Measuring instruments and jigs: • Measuring point: • Test disc and player mode	• Oscilloscope • CH1 : CN401 - 1 (RF) • 8 - inch LD test disc (GGV1003) • Test Mode (Still mode, TRK servo loop close, TILT servo ON)
• Positions to be adjusted	• VR601

Connection diagram



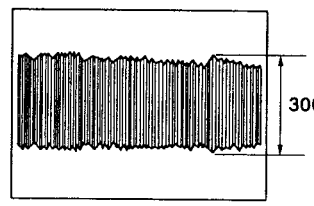


Fig. 1 RF signal

Oscilloscope range
5mV/div
2mS/div
AC mode

Adjustment Procedure

1. Search for frame #15,000 on the test disc.
2. Connect the oscilloscope to CN401 - 1 (RF) and observe the RF signal.
3. Adjust VR601 so that the RF signal's amplitude becomes 300mV ± 50mV. (See Fig. 1.)

8.4.5 ELECTRICAL ADJUSTMENT

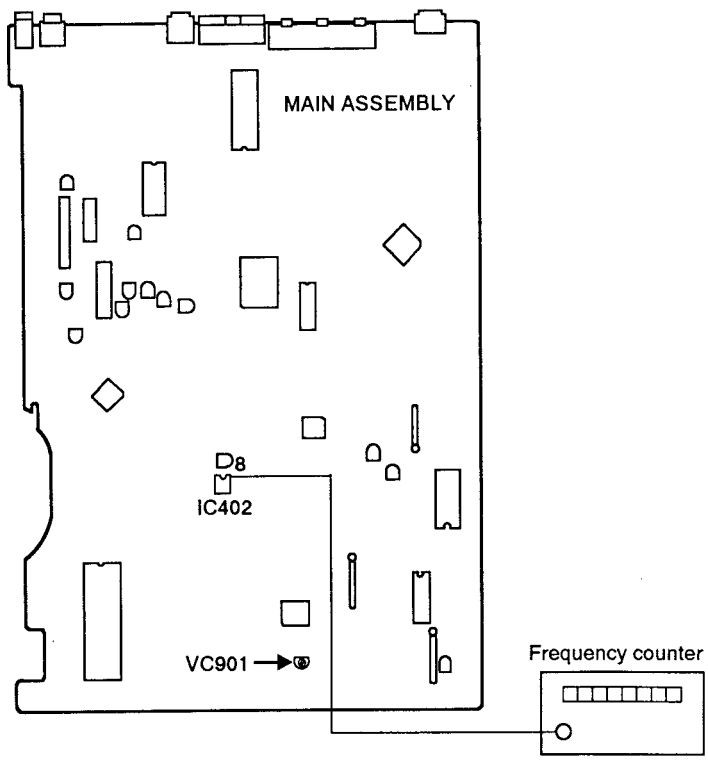
13. Ref. SUB CARRIER ADJUSTMENT

Electrical Adjustment

- Purpose: Adjustment of the standard clock frequency.
- When not properly adjusted: Incorrect color tint, no TV color lock.

• Measuring instruments and jigs: • Measuring point: • Test disc and player mode	• Frequency counter • Oscilloscope 10:1 probe • IC402 (PM0001) pin 8 • Normal mode (Stop mode (Blueback screen))
• Positions to be adjusted	• VC901

Connection diagram



Adjustment Procedure

1. Adjust VC901 on the MAIN assembly so that the frequency of IC402 pin 8 becomes 3.579545MHz in the stop mode (blueback screen).

Note : The frequency counter probe should be an oscilloscope 10 : 1 probe.

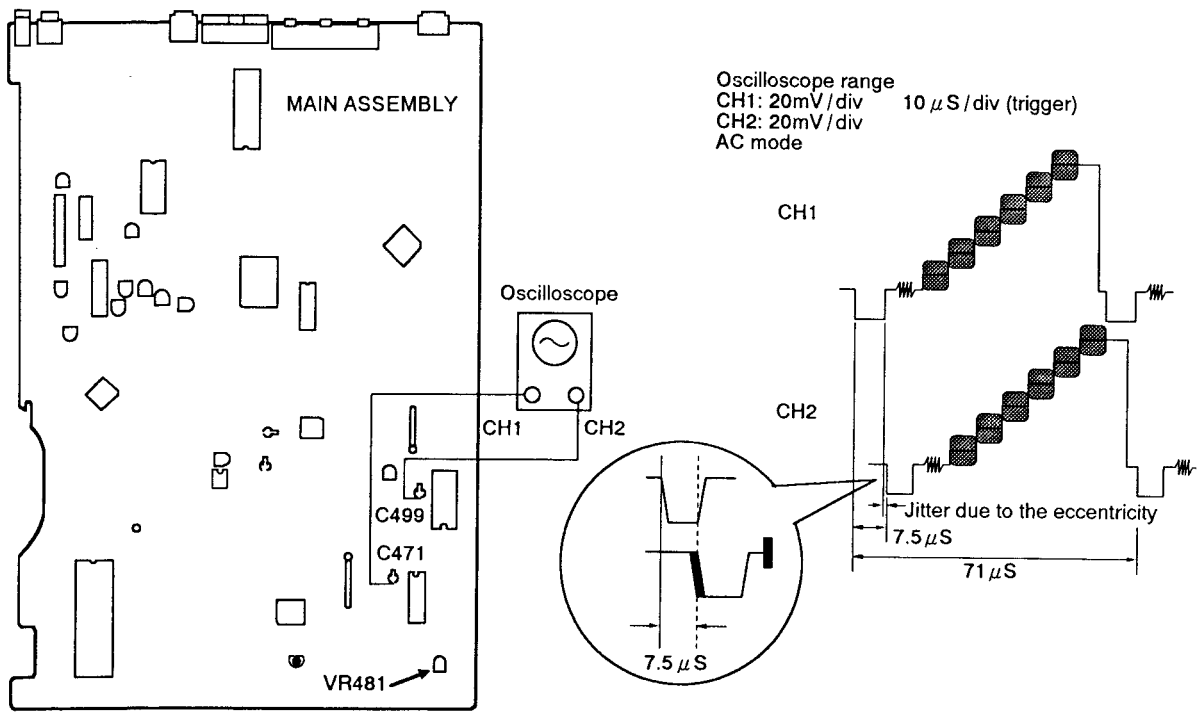
14. VCO CENTER FREQUENCY ADJUSTMENT

Electrical Adjustment

- Purpose: Setting the optimum delay time for the time base error compensation CCD.
- When not properly adjusted: Difficult to color lock, there is color lock delay after a search, and flicker on the white screen.

• Measuring instruments and jigs:	• Oscilloscope
• Measuring point:	• CH 1 : + side lead wire of C471. • CH 2 : + side lead wire of C499.
• Test disc and player mode	• 8-inch LD test disc (GGV1003) • Normal mode (Still mode)
• Positions to be adjusted	• VR481

Connection diagram



Adjustment Procedure

1. Connect the + side lead wire of C471 and the + side lead wire of C499 to CH 1 and CH 2 of the oscilloscope respectively.
   CH 1 : Video signal before time axis error compensation.
   CH 2 : Video signal after time base error compensation.

2. Search for frame #5,100 on the test disc. Adjust VR481 so that the center of CH 1's video signal jitter is delayed by 71 μs (1H + 7.5 μs) with respect to the CH 2's video signal.

Note : Do not confuse CH 1 and CH 2.

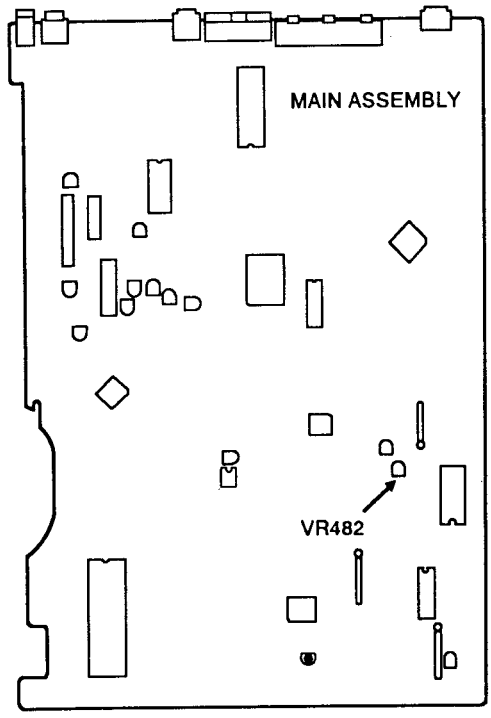
15. OUTPUT VIDEO LEVEL ADJUSTMENT

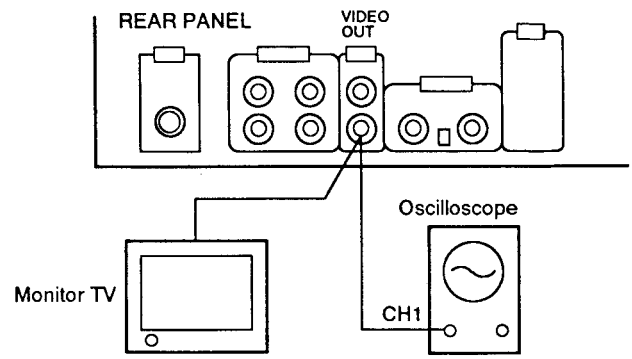
Electrical Adjustment

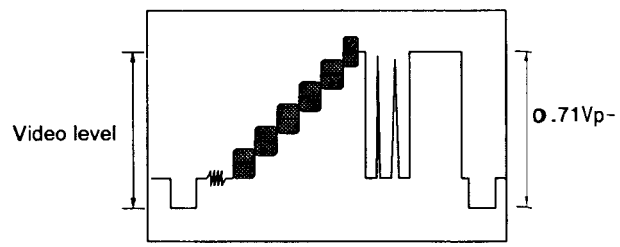
- Purpose: Setting the video signal level to 1Vp-p (75 Ω termination).
- When not properly adjusted: The player starts up midway without reading the data. The screen is too bright or too dark.

• Measuring instruments and jigs:	• Oscilloscope
• Measuring point:	• Player's VIDEO OUT terminal
• Test disc and player mode	• 8-inch LD test disc (GGV1003) • Normal mode (Still mode, #19,900)
• Positions to be adjusted	• VR482

Connection diagram







Oscilloscope range
20mV/div 10 μS/div (trigger)
AC mode

Adjustment Procedure

Note : Since the VIDEO OUT terminal is connected to a TV monitor, it is to have 75Ω termination. (If it is connected to a TV via VHF OUT, terminate the VIDEO OUT terminal with a 75Ω resistor).

1. Search for frame #19,900 on the test disc.
2. Adjust VR482 so that the white level becomes 0.71Vp-p ± 5% from the video signal's sync tip level.

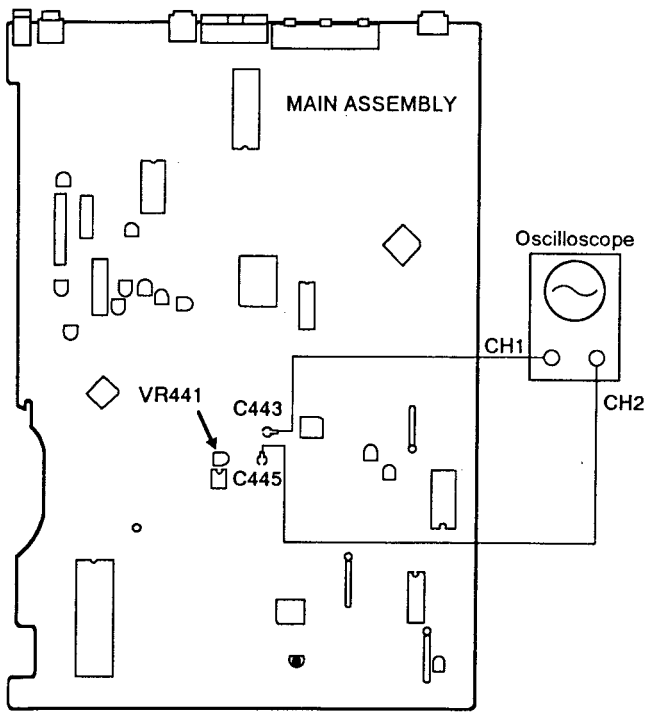
16. 1H DELAY VIDEO LEVEL ADJUSTMENT

Electrical Adjustment

- Purpose: Equalization of the video levels of the 1H delay video signal and the main line video signal.
- When not properly adjusted: If the 1H delay video signal level is high, white dropout will be noticeable and there will be H shifting. (Horizontal stripes across the screen.)

• Measuring instruments and jigs:	• Oscilloscope
• Measuring point:	• CH 1 : – side lead wire of C443 • CH 2 : – side lead wire of C445
• Test disc and player mode	• 8-inch LD test disc (GGV1003) • Normal mode (Still mode)
• Positions to be adjusted	• VR441

Connection diagram



Oscilloscope range AC
CH1: 20mV/div 10 μS/div
CH2: 20mV/div

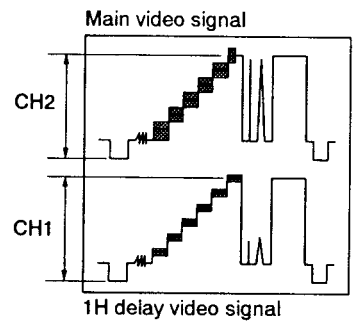


Fig. 1

Adjustment Procedure

1. Search for frame #3,800 on the test disc.
2. Connect – side lead wire of C443 to the oscilloscope's CH 1 and – side lead wire of C445 to the CH 2.
3. Adjust VR441 so that the 1H delay video level (CH 1) becomes the same as the main line video level (CH 2). (See Fig. 1)

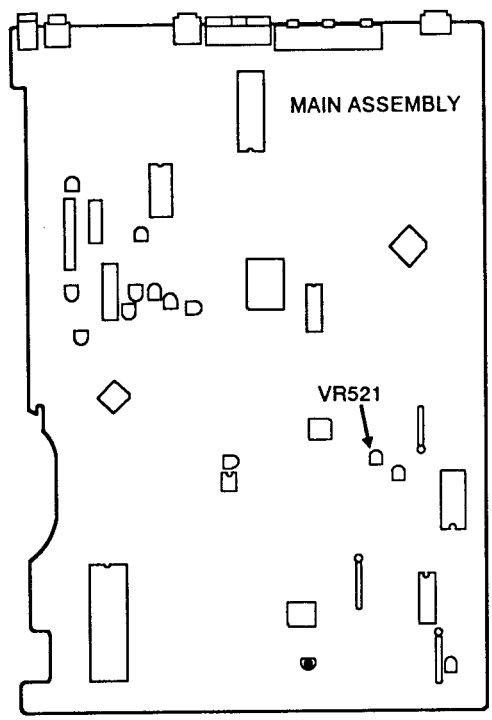
Note : The video level is the level between the SYNC tip and the white peak.

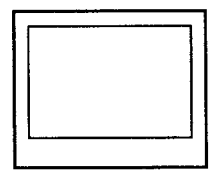
17. VPS ERROR ADJUSTMENT

- Purpose: Optimization of the color tint compensation section's error signal level.
- When not properly adjusted: Substantial color irregularity. (especially on CDV.)

• Measuring instruments and jigs:	• TV monitor
• Measuring point:	
• Test disc and player mode	• 8-inch LD test disc (GGV1003) • Normal mode (Still mode)
• Positions to be adjusted	• VR521

Connection diagram





Color irregularity on the magenta screen is minimized.

Adjustment Procedure

1. Search for frame #8,000 on the test disc. (Magenta screen)
2. Adjust VR521 untill the color irregularity on the magenta screen is minimized.

9. ABBREVIATIONS TABLE

A	
ACCEL	ACCELERATE
ACOM	AUDIO COMPENSATOR
AF	AUDIO FREQUENCY
AFM	ANALOGUE FM AUDIO
AGC	AUTOMATIC GAIN CONTROL
ALC	AUTOMATIC LEVEL CONTROL
ANT	ANTENNA
ATC	AUTOMATIC THRESHOLD CONTROL
B	
BAL	BALANCE
C	
CAV	CONSTANT ANGULAR VELOCITY
CLV	CONSTANT LINEAR VELOCITY
CCD	CHARGE COUPLED DEVICE
CD	COMPACT DISC
CK	CLOCK
CONT	CONTROL
C-SYNC	COMPOSITE SYNCHRONIZATION
CX	AFM NOISE REDUCTION
D	
DEM	DEMODULATOR
DIG/ANA	DIGITAL/ANALOGUE
DL	DELAY LINE
DSP	DIGITAL SIGNAL PROCESSOR
DOS	DROP OUT SENSE
DRV	DRIVER
E	
EFM	EIGHT TO FOURTEEN MODULATION
ERR	ERROR
EQ	EQUALIZER
EXT	EXTERNAL
F	
FCS or FOCS	FOCUS
FG	FREQUENCY GENERATOR
FL	FLUORESCENT LAMP
FTS	FOCUS TRACKING SLIDER
Fsc	CHROMINANCE SUBCARRIER FREQUENCY
FWD	FORWARD
G	
GFS	GET FRAME SYNC LOCK
GND	GROUND
H	
HLD	HOLD
H SYNC	HORIZONTAL SYNCHRONIZATION
I	
INT	INTERNAL
IR	INFRARED RAYS
L	
L-CH	LEFT CHANNEL
LAT	LATCH
LD	LASER DIODE
LPF	LOW PASS FILTER
LIM	LIMITER
M	
MTR	MOTOR
µCOM	MICROCOMPUTER
P	
PD	PHOTO DETECTOR
PB	PLAYBACK
PLL	PHASE LOCKED LOOP
P-ON	POWER ON
R	
R-CH	RIGHT CHANNEL
RTN	RETURN
RFMD	RADIO FREQUENCY MODULATOR
RST	RESET
REV	REVERSE
RF-CORR	RF CORRECTION
S	
SPDL	SPINDLE
SLD	SLIDER
SO	SERIAL OUTPUT
SI	SERIAL INPUT
SCK	SERIAL CLOCK
SC	CHIP SELECT
SYPS	SYSTEM POWER SUPPLY
SW	SWITCH
S/H	SAMPLE & HOLD
SENS	SENSITIVITY
SQ	SQUELCH
T	
TRK or TRKG	TRACKING
TP	TEST POINT
TBC	TIME BASE CORRECTION
TGL	TOGGLE
U	
UNREG	UNREGULATED
V	
V-SYNC	VERTICAL SYNCHRONIZATION
VSQ	VIDEO SQUELCH
VPS	VIDEO PHASE SHIFTER
VDEM	VIDEO DEMODULATOR
VHF	VERY HIGH FREQUENCY
VCA	VOLTAGE CONTROLLED AMPLIFIER
VCO	VOLTAGE CONTROLLED OSCILLATOR
X	
X...	ACTIVATED WHEN LOW VOLTAGE

10. SPECIFICATIONS

1. General

System ..... LaserVision Disc system and Compact Disc digital audio system
Laser ..... Semiconductor laser wavelength 780 nm
Power requirements
U.S. and Canadian models ..... AC 120V, 60 Hz
Multi voltage model ..... AC 110V/120-127V/220V/240V (Switchable), 50/60 Hz
Power consumption
U.S. and Canadian models ..... 39 W
Multi voltage model ..... 43 W
Weight ..... 7.6 kg (16 lbs 12 oz)
Dimensions ..... 420 (W) x 418 (D) x 122 (H) mm
16-9/16 (W) x 16-7/16 (D) x 4-13/16 (H) in
Operating temperature ..... +5°C ~ +35°C (41°F - 95°F)
Operating humidity ..... 5% ~ 90%
(There should be no condensation of moisture.)

2. Disc

LaserVision Discs

*Maximum playing times
12-inch standard play disc ..... 1 hour/both sides
12-inch extended play disc ..... 2 hours/both sides
8-inch standard play disc ..... 28 min/both sides
14 min/one side
8-inch extended play disc ..... 40 min/both sides
20 min/one side
Spindle motor speed
Standard play disc ..... 1,800 rpm
Extended play disc ..... 1,800 rpm (inner circumference) to 600 rpm (outer circumference)
(For a 12-inch disc)

Compact Discs

DISC ..... Diameter: 5-inch, 3-inch, Thickness: 1.2 mm
Rotation direction (pickup side) ..... Counterclockwise
Liner speed ..... 1.2 ~ 1.4m/sec
*Maximum playing time
74 min. 5-inch discs
20 min. 3-inch discs
(For stereo playback)

Compact Discs with Video

Disc ..... Diameter: 5-inch, Thickness: 1.2 mm
Rotation direction (pickup side) ..... Counterclockwise
Linear speed ..... Audio portion: 1.2 ~ 1.4m/sec
Video portion: 11 ~ 12m/sec
*Maximum playing time ..... Video portion: 5 min. (CLV)
Audio portion: 20 min. (Digital)

** Actual playback time differs for each disc.*

3. Video characteristics (two pairs)

Format ..... NTSC specifications
Video output
Level ..... 1 Vp-p nominal, sync. negative, terminated
Impedance ..... 75Ω unbalanced
Jack ..... RCA jack

4. S-Video output

Y (luminance) - Output level ..... 1 Vp-p (75 Ω)
C (color) - Output level ..... 286 mVp-p (75 Ω)
Jack ..... S-VIDEO jack

5. Audio characteristics (two pairs)

Output level
During analog audio output ..... 200 mVrms (1 kHz, 40%)
During digital audio output ..... 200 mVrms (1 kHz, -20 dB)
Jacks ..... Both RCA jacks
Number of channels 2

Digital Audio Characteristics

Frequency response	4 Hz - 20 kHz (±0.3 dB) (EIAJ)
SN ratio	112 dB (EIAJ)
Dynamic range	99 dB (EIAJ)
Channel separation	103 dB (EIAJ)
Total harmonic distortion	0.0019% (EIAJ)
Wow and flutter	Limit of measurement (EIAJ)

5. Other Terminals

Control input/output ..... Both miniature jacks
CD-DECK synchro ..... Miniature jack
VHF adapter output (Video/Audio) ..... Both RCA jacks with DC jack
Optical digital output ..... Optical digital jack

6. Accessories

Remote control unit (CU-CLD048) 1
Size "AAA" (IEC R03) dry cell batteries 2
Video cord 1
Audio cord 1
Operating instructions 1
Warranty card 1

7. Functions

Remote control unit operations (CU-CLD048)

	Function	Standard play Disc (CAV)	Extended play Disc (CLV)	Compact Disc with Video	Compact Disc
Basic Functions	Single-side play	YES	YES	YES	YES
	Pause	YES	YES	YES	YES
	Stop	YES	YES	YES	YES
Search	Fast forward (forward and reverse)	YES	YES	YES	YES
	Chapter/Track skip	YES	YES	YES	YES
	Direct chapter/Track number search	YES	YES	YES	YES
	Frame number search	YES	NO	NO	NO
	Time number search	NO	YES	YES	YES
	Absolute time search	NO	NO	NO	YES
Program	Chapter/Track program play	YES	YES	YES	YES
	Program correction	YES	YES	YES	YES
Repeat	Repeat between 2 points	YES	YES	YES	YES
	Memory repeat	YES	YES	YES	YES
	Chapter/Track repeat	YES	YES	YES	YES
	One-side repeat	YES	YES	YES	YES
	Program repeat	YES	YES	YES	YES
	Random repeat	YES*1	YES*1	YES	YES
	Program random repeat	YES	YES	YES	YES
Trick play	Still/Step	YES	NO	NO	NO
	Multi-speed (Forward/reverse 9-level variable)	YES	NO	NO	NO
Time display	Elapsed time display	NO	YES	YES	YES
	Absolute time display	YES*1	NO	NO	YES
	Remaining track time display	NO	NO	YES	YES
	Remaining total time display	YES*1	YES*1	YES	YES
	Total number of selections, total time display	YES*1	YES*1	YES	YES
Others	Single play	YES	YES	YES	YES
	Hi-Lite scan	NO	NO	YES*4	YES
	Intro scan	YES	YES	YES*5	NO
	Digital level control	YES*3	YES*3	YES	YES
	CX system ON/OFF	YES*2	YES*2	—	—
	AUTO DIGITAL/ANALOG switch	YES*3	YES*3	—	—
	Audio channel selection (Stereo, 1/L, 2/R)	YES	YES	YES	YES

*1 Only discs with TOC

*2 Valid for analog sound playing a disc with the CX mark.

*3 Can only be used with discs with digital sound tracks.

*4 Audio part only

*5 Video part only

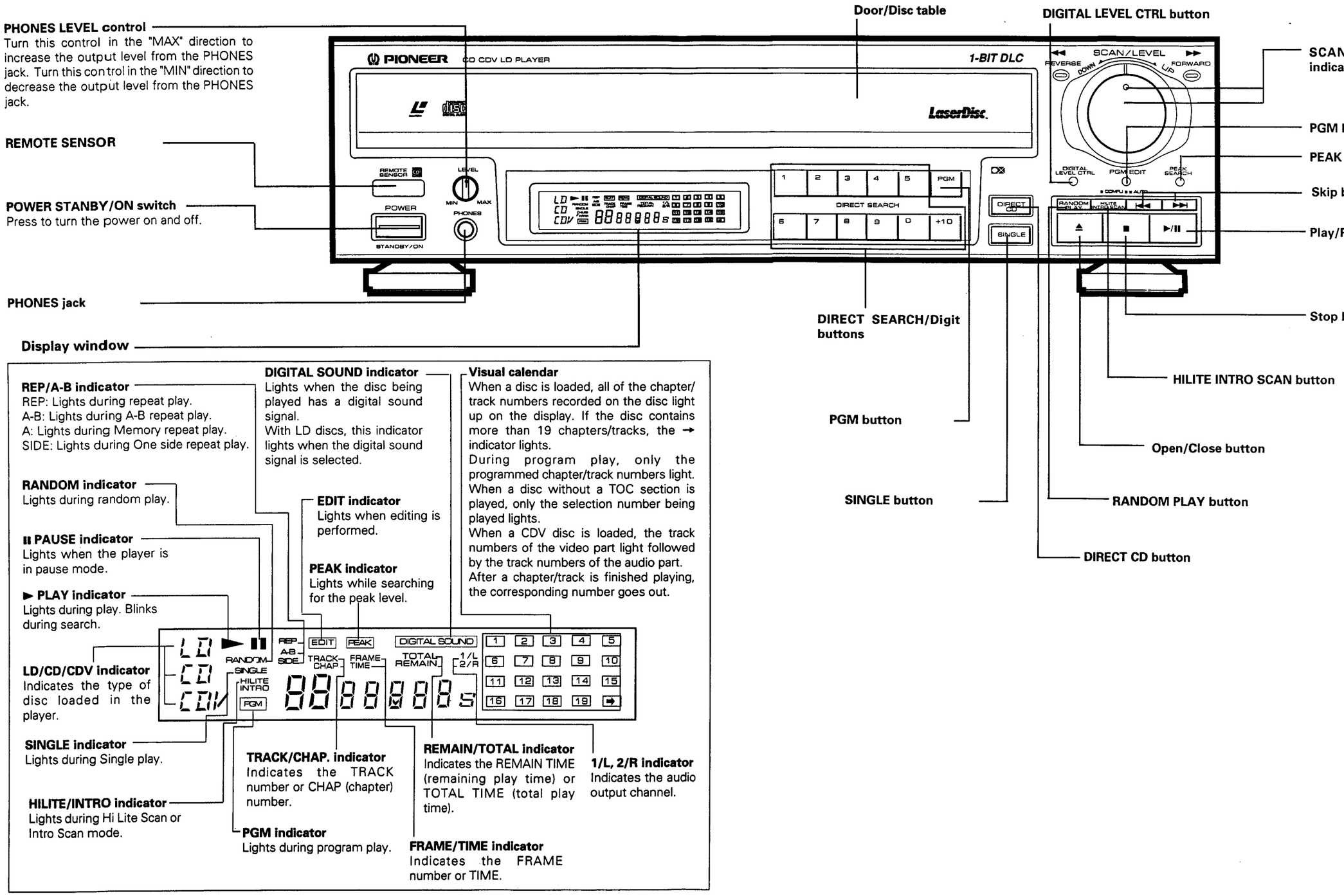
NOTE:

The specifications and design of this product are subject to change without notice, due to improvement.

PLAYER FUNCTIONS

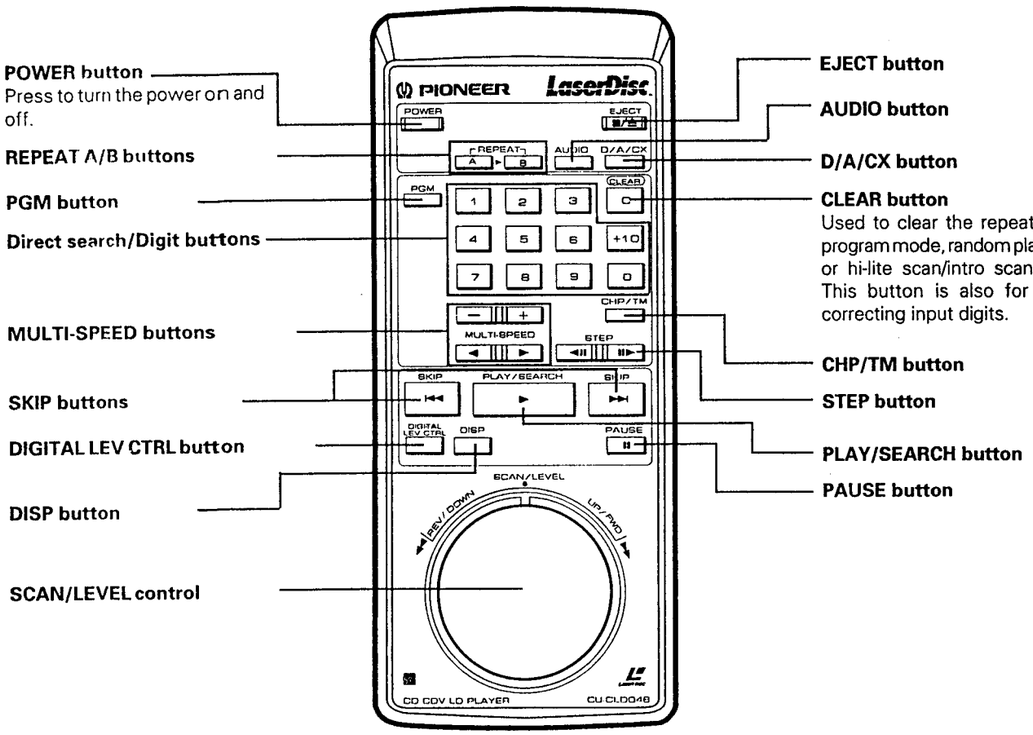
- Display, Visual Calendar Display
- Intro Scan, Hi-Lite Scan, Direct CD, Singl Play, Digital Level Control, Peak Search, Random Playback, Program Random Playback and Compu Program/Auto Program Edit
- Digital Sound for LaserVision Discs
- Last Memory

11. PANEL FACILITIES

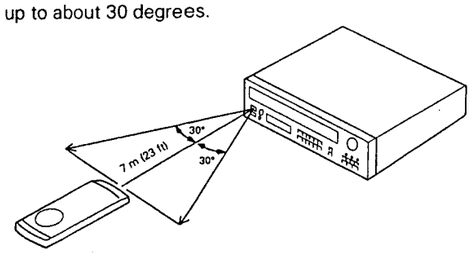


NAMES AND FUNCTIONS OF REMOTE CONTROL UNIT COMPONENTS

Remote control buttons with the same names or marks as buttons on the front panel of the player control the same operations as the corresponding front panel buttons.



When operating the remote control unit, point the unit's infrared signal transmitter at the remote control receiver (REMOTE SENSOR) on the front panel of the player. The remote control unit can be used within a range of about 7 meters (23 feet) from the remote sensor, and within angles of up to about 30 degrees.



NOTE FOR USING THE REMOTE CONTROL UNIT

- *If a plug is connected to the CONTROL IN terminal at the rear of the player, remote control operations cannot be done with the remote control unit aimed at the player's remote control sensor. Aim the remote control unit at the AV control center or the component display's sensor instead.*
- *If there is any obstacle between the remote control unit and the player, or if the unit is held at too large an angle relative to the front panel of the player, the signal from the remote control unit will fail to reach the remote sensor.*
- *If the player is operating in the vicinity of other appliances generating infrared rays, or if other remote control devices using infrared rays are used near the player, the player may operate improperly. Conversely, if the player's remote control unit is operated in the vicinity of other appliances which use an infrared remote control device, the other appliance may operate improperly. If this should happen, change the place of installation so that improper operation does not occur.*
- *If the range of operation of the remote control unit becomes too short, replace the batteries.*
- *When the unit is not to be used for a long period of time (more than one month), remove the batteries to prevent them from leaking inside the compartment. If leakage occurs, wipe up the liquid inside the compartment and replace the batteries with new ones.*
- *Do not place books or other objects on the remote control unit, since they might depress the keys and run down the batteries.*